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What Factors Drive the Banks Systemic Risk among South Asian Countries?

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Quaisar Ijaz Khan, College of Commerce, Government College University, Faisalabad, Pakistan.
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ARTICLE DETAILS

ABSTRACT

Purpose: This study designs to examine the determinants (size, liquidity ratio, leverage ratio, deposit ratio, asset growth, net interest income ratio and return on asset ratio) of bank’s systemic risk. We use the data of listed commercial banks of the South Asian countries (Pakistan, Bangladesh, and India).

Design/Methodology/Approach: The sample consists 30 banks from Bangladesh, 87 banks from India and 22 banks from Pakistan. This study covers the period from 2006 to 2018. The data is collected from the published annual reports of banks and stock exchanges of respective country. The panel data analysis is performed for the estimation of research models.

Findings: The findings demonstrate that larger banks contribute lower in the systemic risk of banks. Additionally, highly liquid banks enhance the systemic risk of the banking system. Moreover, the banks with greater reliance on the deposits, net interest income and with high return on asset reduce the systemic risk contribution of the banks.

Implications/Originality/Value: This study provides the justification to devise the banking policies like enhance the proportion of liquidity among assets, reliance on net interest income and promote the financing needs through deposits to limit the systemic risk contribution of the banking system.

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Introduction

Recent financial crisis develops the interest to study the phenomena of bank’s systemic risk. Systemic risk is a situation when the failure of banks or financial institutions and its intermediaries have effect on entire banking system or financial institutions due to interconnections of these banking systems/financial institutions and financial intermediaries. The
failure of banking system, financial institutions, and financial intermediaries take on to financial distress on financial institutions which give money to it, this leads to distress to some financial institutions. This leads to spillover effect across financial institutions and intermediaries across countries (Dash 2019).

The subsequent Euro-zone crises (2010-11) and the global financial crises (2008-09) getting attention of regulators and policy makers to find out the measures of systemic risk in banking system. The various financial organizations need to considerate those elements which are contributing to systemic risk. The breakdown of the absolute most unmistakable banks on the world, including the Washington Mutual and Lehman Brothers Bank, alongside a few close failures which must be rescued of emergency by the Government of U.S., featured the essentialness of getting, estimating, and observing systemic risk (Oanea et al 2016).

The many financial institutions and its intermediary have gone failure due to the global financial crises. These crises have a direct effect on banking sectors due to this effect many banking sectors of the world gone bankruptcies. The bank faced slow down economic growth in the form of systemic risk. The failures of banks awake the significance of systemic risk to monitor and supervise the factors which affect the systemic risk. With the development of networking technology in banking sectors and interlinked financial institutions across the countries to increase the risk spillover across the countries (Adrian and Brunnermeier, 2016).

Business analysts have recommended that undercapitalization of huge financial organizations can bring about budgetary shakiness, especially when the whole monetary organizations is undercapitalized. This is prompts the idea of "too interconnected to fail" (TICTF), for example that financial organizations that are profoundly between associated with different institutions are fundamentally significant thus can't be permitted to fail. A comparative idea is that of "too big to fail" (TBTF), for example that big financial organizations are so fundamentally significant that they can't be permitted to fail.

An inquiry that few researchers have presented is: which money related organizations ought to be bailed out in case of a dissolvability/liquidity crisis (Acharya et al 2012)? This sensibly requires distinguishing which organizations are basic to strength of the financial framework, for example "systemically significant." The Basel Committee on Banking Supervision (BCBS), demonstrate the idea of systemic significance ought to be estimated as far as the potential effect of the failure of a bank on the worldwide monetary framework and more extensive economy, as opposed to simply the risk that a failure can happen (Zhou 2014).

The various hypotheses are recommending that enormous and complex banks add to systemic risk. A potential pulls for the fundamental significance of huge, between associated banks is good peril; as controllers are reluctant to shut or slacken down immense and complex banks, this leads banks to go out over the top chance the longing for government bailouts (Tirole 2012). Another plausibility is that of agency effects, for example that poor administration of big and complex banks can prompt bank administrators taking part in non-traditional risky activities (for instance, exchanging) and will in general be financed increasingly through momentary obligation, making them progressively helpless against liquidity stuns and market failures (Ratnovski, 2012).

This study uses the data of commercial banks of the South Asian countries (Pakistan, Bangladesh, and India). The selected countries’ central banks make policies to formulate and regularize the smooth functions of respective countries scheduled commercial banks. Banks of these countries consist of foreign banks, private banks, co-operative bank and Commercial banks provide multiple services. In Bangladesh, four nationalized banks operate their businesses, thirty-nine commercial and private banks perform their services. In Pakistan, seven nationalized banks
perform their services. In India, twenty-seven nationalized banks have run their business to facilitate the business.

This study examines the determinants of bank systemic risk using panel data analysis. The same studies developed for developing countries to determine their effect on bank systemic risk. The rest of the paper organize as follows section 2 describes literature review, section 3 methodology, section 4 result & discussion and section 5 conclude the discussion.

**Literature Review**

There are numerous studies which have been proposed for the measurement of systemic risk. The measurement of systemic risk in previous studies represents as follows. Galati and Moessner (2013) explained that there is no consensus on systemic risk definition despite the plethora of research on the subject matter. Biasis (2012) stated that the focus on different phenomena like imbalances, the negative effect on the economy, information asymmetry, effects of feedback, contagion, asset bubbles, and negative externalities collapse in confidence, financial institutions’ exposures correlated in nature.

The systemic risk indicates a dire need for generally accepted measures and well-defined principles for measuring it. Due to complex nature of systemic risk and lack of consensus in the literature regarding definition. Financial analysts are attempting to issue suitable observational measures to more readily ascertain the systemic risk measures as they think about the broadly utilized ones, the Beta and the Value at Risk, weren't proficient to manage the worldwide virus as commandingly exhibited by the ongoing monetary emergency (Danielsson et al., 2011).

The systemic risk related literature consists of the theoretical models that scrutinize specific aspects and evaluate of the systemic risk. It consists of the empirical analyses of the historical events, which are considered as the financial crisis. The standard Merton model develops for the financial system monitoring, proposed by some researchers (Lehar 2005). The data availability one of the crucial inadequacies to systemic risk measures. However, researchers develop to manage fine indicators of fragility. Few studies like Elsinger et al. (2006) and Gauthier et al. (2012), used network analysis in order to detect the level of distress exerted on financial institutions, for the British and Canadian Banks and inter markets. Their analysis relies more on the existing linkages between the agents.

Another methodology estimates systemic risk commitment in a manner that takes the free information of securities exchange come back to measures the commitments of the fundamental danger of each money related establishments. The instances of these methodologies Marginal Expected Shortfall (MES) and Systemic Expected Shortfall (SES). These methodologies estimate the foundational chance commitments use securities exchange return information. The (MES) approach creates by Acharya (2017) and (SES) approach creates by Pedersen, Philippon, and Richardson (2010).

The calculation of the systemic risk contribution of financial institutions a few other authors used Credit Default Swaps (CDS). Furthermore, Segoviano and Goodhart (2009) using the CDS data constructed a stability index to measure interdependence of financial institutions. This restricts researchers to use this measure to recognize systemic risk contribution of various financial institutions within the economy due to non-accessibility of information. Also, Acharya, Pederson, Philippon, and Richardson (2017) to gauge the systemic risk commitment of budgetary establishments proposed Systemic Expected Shortfall (SES) and Marginal Expected Shortfall (MES). During the seasons of monetary related misery, they quantified the foundational chance commitment of a monetary organization.
The measures of the Systemic Expected Shortfall (SES) and Marginal Expected Shortfall (MES) use financial institutions equity returns. The marginal expected shortfall (MES) is the loss of the financial institution that is average in nature and the Systemic Expected Shortfall (SES) is the weighted average of the leverage and MES (Acharya et al., 2017). However, Brownlees and Engle (2011) for computations of time-varying systemic risk used the bivariate model of GARCH and the non-parametric estimator. Schwab, Koopmans, and Lucas (2010) for measurement of systemic risk proposed a framework. They develop indicator for large number of financial institutions. Due to access to the credit and unobserved changes in the supply, the credit risk conditions can separate from the fundamentals and disconnect. These conditions will increase the financial distress and leads the financial instability of the system. Acharya proposed the SRISK measures, Engle and Richardson (2012) and Brownlees and Engle (2012) use the Marginal Expected Shortfall (MES). Marginal Expected Shortfall (MES) measure considers the size of financial institution and structure of liabilities.

Data of Romanian banks show that financial leverage, market to book value, size and risk was positively affecting the contribution of systemic risk (Oanea et al., 2016). They employed ($\Delta$CoVar) systemic risk contribution approach. In Europe, banks systemic risk, size and leverage positively contribute to systemic risk (Bori et al., 2012). Hautsch et al (2014) deployed the ($\Delta$CoVar) approach and used the data of European banks, they found that unlike funding risk and leverage, bank size is dominant factor of systemic risk. Vallascas and Keasey (2012) use the data of European banks, result shows that size, leverage, and liquidity determine the bank systemic risk. The businesses, loans to individuals and other organizations, as well as securities that it owns are the major assets of banks. The depositors, shareholders, and money that are borrowed from other banks bank are able to obtain such assets due to capital. Bank generates income cannot use all of its assets. The cash must be available for customers from required reserves; because of leverage, a bank’s return on equity is typically much higher than their return on assets. Leverage is the concept of increase possible return on investment using borrowed funds. Systemic risk logically increases as return on assets decreases like it did prior to and during the financial crisis Jeffrey Mills (2018).

Methodology

This study deploys the panel data of banks in three South Asian countries namely Bangladesh, India, and Pakistan. This study covers the period from 2006 to 2018. The study examines each country's banks on the country level. The study uses bank-level determinants (size, leverage ratio, liquidity ratio, assets growth, deposit ratio, and net interest income ratio) to examine the risk contribution in systemic risk. The sample selection consider countries which are ruled by two hundred years under the British ruler. The central bank makes policies to formulate and regularize the smooth functions of banks in respective countries. Banks of countries have foreign banks, private banks, cooperative bank commercial these banks provide different services. The same studies develop for developing countries to determine their effect on bank systemic risk.

Data

This study explores the determinants of bank systemic risk. The study determines to scrutinize the potential determinants of systemic risk in banking sector. The study selects these countries because are countries have similar in the banking mode of transaction due to cultural similarities among these countries. The study aims to develop to determine whether the factors that are affecting the bank’s systemic risk are the same among the South Asian countries. The population consists of all countries of South Asia and data is collected from Stock exchanges of each country, i.e. Pakistan, India, Bangladesh. The sample contains 30 banks from Bangladesh, 87 banks from India and 22 banks from Pakistan. The stock prices and bank-level data is collected from PSX (Pakistan stock trade) and websites of all listed commercial banks. Indian information of stock prices is extracted from NSE (National stock trade) and Bombay stock exchange for
listed commercial banks data get from these Indian stock exchanges. Same as for Bangladesh stock price data is collected from DSE (Dhaka stock exchange) and Chittagong stock exchange. The Bangladesh stock prices data is extracted from both stock exchanges. This study uses other sites for collection of data like Bloomberg, Wall street journal, and Business recorder.

**Data sources**

<table>
<thead>
<tr>
<th>Countries</th>
<th>Stock Exchange/s</th>
<th>Number of Listed Banks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pakistan</td>
<td>Pakistan Stock Exchange</td>
<td>22</td>
</tr>
<tr>
<td>India</td>
<td>National Stock Exchange</td>
<td>87</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>Dhaka Stock Exchange</td>
<td>30</td>
</tr>
</tbody>
</table>

**Measurement of Variables**

We use the Marginal Expected Shortfall (MES) to measure the bank systemic risk. The marginal expected shortfall (MES) proxy is developed by Acharya et al (2017). It is the situation when the whole market goes down in a specific period. The Marginal expected shortfall (MES) during this time period the worst 5% days’ contribution to systemic risk Acharya et al (2013). Size measures as the log of total assets (Smirlock, 1985). Return on assets measures as net profit after tax over total asset (Matar 2003). The liquidity ratio used in this study measure as liquid assets over total assets. The higher liquidity ratio showing that more short lived assets of a bank. Liquidity ratio measures as securities over total assets (Anbar et al 2011). Bank major sources for funds deposits considered an important part (Anbar et al 2011). Deposit ratio calculates as banks deposit over total assets. Net income calculated as net profit over total fund (Dash, 2019). Leverage ratio measures as total assets over total common equity. Asset growth measures as quarterly total asset return % (Zhao et al 2018).

The Study explores the determinants (size, leverage ratio, liquidity ratio, and deposit ratio, return on assets ratio, net interest income ratio, and assets growth) on bank systemic risk use panel regression. In this case, the research model of systemic risk writes as follows.

Systemic Risk (MES)$_{it}$ = $\alpha_0 + \alpha_1$(SIZE)$_{it}$ + $\alpha_2$(LEV)$_{it}$ + $\alpha_3$(ROA)$_{it}$ + $\alpha_4$(AG)$_{it}$ + $\alpha_5$(LIQ)$_{it}$ + $\alpha_6$(NII)$_{it}$ + $\alpha_7$(DR)$_{it}$ + $i_t$

Where $i_t$ = in period t, $\alpha$ =Constant term, $i_t$ =Random error term, MES= Marginal Expected Shortfall, SIZE= Log of total assets, LEV= Leverage Ratio, ROA= Return on Assets, AG= Assets Growth, LIQ= Liquidity Ratio, NII= Net Interest Income Ratio, DR= Deposit Ratio, (MES)$_{it}$ = MES use as a concentrate subordinate variable as intermediary of foundational chance. MES estimates when the general market is in the tail of its misfortune appropriation the normal firm return on 5 % most noticeably terrible days. Size = size measures as a log of total assets, LEV$_{it}$ = Leverage is a measure of total assets over total equity, ROA$_{it}$ = Return on assets (ROA) measures as net income over total assets.AG$_{it}$ = Asset growth is a measure to be given through the quarterly return on total assets.LIQ$_{it}$ = Liquidity measures as securities available for sale over total assetsNII$_{it}$ = Net interest income measures as net profit over total fundsDR$_{it}$ = Deposit ratio measures as a total deposit over total assets.

**Findings**

This study is designed to identify the factors which influence the systemic risk of banking system in south Asian countries. We determine the extent by which few banks contribute less and other contribute high in the financial system risk. Descriptive statistics, correlation matrix and regression analysis are used to examine the results of this study.

**Descriptive Statistics and Correlation Matrix**

Table 1 shows the descriptive statistics for all countries namely Bangladesh, India, and Pakistan and covers the period from 2006 to 2018. It reports the summary of variables (percentile points, mean, median and standard deviation) which are deployed to estimate the linear models in the regression results section.
MES has a mean value of -0.0307 which shows that banks on average contribute to the financial system risk. The explanatory variables of the study are size, liquidity ratio, leverage ratio, asset growth, return on assets, deposit ratio, and net interest income ratio. Figure 1 explains the detailed risk contribution of on average banks in their respective country financial system risk. All countries banks contribute more to the financial system risk during the financial crisis of 2007-09. Later on, all countries central banks may take corrective action to reduce the risk contribution of individual banks to a whole financial system.

### Table 1: Descriptive Analysis

<table>
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<tr>
<th></th>
<th>P01</th>
<th>P25</th>
<th>Mean</th>
<th>Median</th>
<th>P75</th>
<th>P99</th>
<th>Stdev</th>
</tr>
</thead>
<tbody>
<tr>
<td>MES</td>
<td>-0.0815</td>
<td>-0.0423</td>
<td>-0.0307</td>
<td>-0.0295</td>
<td>-0.0195</td>
<td>0.0023</td>
<td>0.0176</td>
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<tr>
<td>Liq</td>
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<td>0.0726</td>
<td>0.1109</td>
<td>0.0957</td>
<td>0.1374</td>
<td>0.3209</td>
<td>0.0623</td>
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<tr>
<td>Lev</td>
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<td>15.0640</td>
<td>14.8493</td>
<td>18.2825</td>
<td>49.1744</td>
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<td>AG</td>
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<td>-0.1517</td>
<td>0.0090</td>
<td>0.2368</td>
<td>1.8871</td>
<td>0.8736</td>
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<tr>
<td>ROA</td>
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<td>0.0039</td>
<td>0.0068</td>
<td>0.0082</td>
<td>0.0129</td>
<td>0.0425</td>
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<td>DR</td>
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<td>0.7727</td>
<td>0.8078</td>
<td>0.8569</td>
<td>0.9110</td>
<td>0.1360</td>
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<tr>
<td>II</td>
<td>0.0832</td>
<td>0.6447</td>
<td>0.7260</td>
<td>0.7686</td>
<td>0.8787</td>
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<tr>
<td>NII</td>
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<td>0.1213</td>
<td>0.2740</td>
<td>0.2314</td>
<td>0.3553</td>
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<td>0.3261</td>
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MES is Marginal Expected Shortfall, size is natural log of bank size, Liq is liquidity ratio, Lev is leverage ratio, AG is assets growth, ROA is the return on assets ratio, DR is deposit ratio, and II is interest income ratio.

Table 2 reports the correlation coefficient of the systemic risk. It is positively correlated with size leverage, return on assets and interest income. Furthermore, systemic risk is negatively correlated with liquidity, assets growth, and deposit ratio. Explanatory variables have small correlation values which indicate that there is little/no problem of multicollinearity.

Figure 1. Bank’s Average Risk Contribution in their Banking System
Table 2. Correlation Matrix

<table>
<thead>
<tr>
<th></th>
<th>MES</th>
<th>Size</th>
<th>Liq</th>
<th>Lev</th>
<th>AG</th>
<th>ROA</th>
<th>DR</th>
<th>II</th>
<th>D_I</th>
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<td></td>
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<td></td>
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<td></td>
<td></td>
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<tr>
<td>Size</td>
<td>0.2316</td>
<td>1</td>
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</tr>
<tr>
<td>Liq</td>
<td>-0.1485</td>
<td>-0.1288</td>
<td>1</td>
<td></td>
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<tr>
<td>Lev</td>
<td>0.0044</td>
<td>0.0360</td>
<td>-0.1055</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>AG</td>
<td>-0.1256</td>
<td>-0.1448</td>
<td>0.0598</td>
<td>-0.1120</td>
<td>1</td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>ROA</td>
<td>0.1142</td>
<td>0.1473</td>
<td>-0.0914</td>
<td>-0.2701</td>
<td>0.1555</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DR</td>
<td>-0.0300</td>
<td>-0.1860</td>
<td>-0.1392</td>
<td>0.2792</td>
<td>0.0024</td>
<td>-0.1239</td>
<td>1</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>II</td>
<td>0.0605</td>
<td>-0.0880</td>
<td>-0.1344</td>
<td>-0.0223</td>
<td>-0.0302</td>
<td>0.1815</td>
<td>0.2183</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>D_I</td>
<td>-0.0789</td>
<td>-0.0277</td>
<td>-0.4381</td>
<td>0.0829</td>
<td>-0.0347</td>
<td>0.0534</td>
<td>0.3210</td>
<td>0.3611</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>D_B</td>
<td>0.2058</td>
<td>0.8403</td>
<td>0.0352</td>
<td>-0.0744</td>
<td>-0.0886</td>
<td>-0.0099</td>
<td>-0.2842</td>
<td>-0.2290</td>
<td>-0.3371</td>
<td>1</td>
</tr>
</tbody>
</table>

Regression Results

While focusing on the research objective, Table 3 reports the results of generalized least square regression models to identify the drivers of systemic risk in the banking system of south Asian countries. Column “Variables” represent the variables of study i.e. size, liquidity ratio, leverage, assets growth, return on assets, deposit ratio, and net interest income ratio. Column “All Banks” reports the results of full sample of all banks in south Asian countries and column Pakistan, India, and Bangladesh reports the regression results i.e. co-efficient of the variables and p-value in parenthesis of banks in Pakistan, India and Bangladesh respectively. We estimate the panel regression models but Hausmann (1978) test suggested that the random effect is suitable for banks of Bangladesh and fixed effect model is appropriate for banks of Pakistan and India. Afterward, diagnostic tests highlight the problem of heteroscedasticity and cross-sectional dependence for banks of Pakistan and India, which forced to use generalized least square approach for estimation of research models.

Table 3. Determinants of Commercial Banks in South Asian Countries

<table>
<thead>
<tr>
<th>Variables</th>
<th>All Banks</th>
<th>Pakistan</th>
<th>India</th>
<th>Bangladesh</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coefficient (P-Value)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept</td>
<td>-0.0567*** (0.000)</td>
<td>-0.1032*** (0.000)</td>
<td>-0.0414** (0.019)</td>
<td>-0.0754** (0.036)</td>
</tr>
<tr>
<td>Size</td>
<td>0.0014** (0.028)</td>
<td>0.0041*** (0.000)</td>
<td>0.0009*** (0.031)</td>
<td>0.0019** (0.028)</td>
</tr>
<tr>
<td>Liquidity</td>
<td>-0.0562** (0.000)</td>
<td>-0.0356** (0.024)</td>
<td>-0.0837*** (0.004)</td>
<td>0.0227** (0.045)</td>
</tr>
<tr>
<td>Leverage</td>
<td>-0.00002 (0.298)</td>
<td>-0.00002 (0.359)</td>
<td>-0.0007 * (0.091)</td>
<td>-0.0006 (0.188)</td>
</tr>
<tr>
<td>Asset Growth</td>
<td>-0.0000 (0.586)</td>
<td>0.0003 (0.257)</td>
<td>-0.0000 (0.496)</td>
<td>-0.0093 (0.107)</td>
</tr>
<tr>
<td>Return on Assets</td>
<td>0.0610 (0.227)</td>
<td>0.1317* (0.070)</td>
<td>-0.0621 (0.387)</td>
<td>0.4011 (0.423)</td>
</tr>
<tr>
<td>Deposit Ratio</td>
<td>0.0048 (0.419)</td>
<td>-0.0018 (0.889)</td>
<td>0.0714* (0.090)</td>
<td>-0.0032 (0.781)</td>
</tr>
<tr>
<td>Interest Income</td>
<td>0.0057** (0.019)</td>
<td>-0.009* (0.072)</td>
<td>-0.0551* (0.063)</td>
<td>0.0144** (0.025)</td>
</tr>
<tr>
<td>D_I</td>
<td>-0.0075*** (0.000)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D_B</td>
<td>0.0001 (0.991)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R-Square</td>
<td>0.2076</td>
<td>0.1704</td>
<td>0.2607</td>
<td>0.1741</td>
</tr>
<tr>
<td>F-Statistics</td>
<td>16.35*** (0.000)</td>
<td>17.54*** (0.000)</td>
<td>8.61*** (0.000)</td>
<td>14.75*** (0.000)</td>
</tr>
</tbody>
</table>

Dependent Variable: Marginal Expected Shortfall

Size has a significant positive co-efficient for banks of all countries and individually for all countries i-e Pakistan, India and Bangladesh. It shows that large banks contribute less to infect other banks to indulge in financial crisis. It observed from macro perspective that banking system is more vulnerable if it more heavily composed of small banks. Conversely, banking system is considered as more stable if it contains high number of large banks. These results are contradictory with the findings of European banks Haq and Heaney (2012), Black et al. (2013) and Varotto and Zhao (2014). Based on this result, devising policies for controlling of bank size may deployed to reduce the systemic risk. This is contradiction of “Too Big To Fail” arguments.
It may be the reason that banking policy makers take corrective action against large banks because financial crisis largely hit the large banks.

In Table 3, liquidity has a significant adverse effect on the systemic risk of banks in all countries, Pakistan, and India as well. It shows that the highly liquid banks contribute greater for the systemic risk of the banking system. It may be the reason that banks with greater investment in short lived asset likely to indulge in risk-taking activities and have low NPV project. It results of high contribution in the systemic risk of the banking system. Whereas, bank’s liquidity in Bangladesh have positive influence on the systemic risk. It might be the justification that banking policy maker may consider the financial crisis and take corrective action to reduce the negative effect of liquidity on the systemic risk of banking system in Bangladesh.

Our results for leverage, assets growth, return on assets and deposit ratio have insignificant/little effect on the systemic risk of the banking system. Whereas, interest income has mixed effect on the systemic risk. Interest income have significant positive effect on the bank systemic risk in sample of south Asian banks and Bangladesh. However, interest income has adverse effect on the systemic risk in Pakistan and India. It implies that the higher the reliance of a bank on interest income more likely to contribute less in the systemic risk of the banking system in Bangladesh. Moreover, Indian banks dummy have a significant positive impact on the bank systemic risk. It shows that Indian banks contribute higher in the systemic risk of banking system among south Asian countries.

Conclusion
This study designs to examine the determinants (size, liquidity ratio, leverage ratio, deposit ratio, asset growth, net interest income ratio and return on asset ratio) of bank’s systemic risk in south Asian countries. In particular, why some banks contribute higher for the systemic risk of the banking system than their counterparts. The findings demonstrate that larger banks reduce the systemic risk of the banks, while, liquid banks enhance the systemic risk of the banking system. Moreover, the banks with greater reliance on the deposits, net interest income and high return on asset reduce the systemic risk contribution by banks.

The finding of this study put note for policymakers and regulatory authorities of the banking system to consider multiple factors while assessing the systemic risk contribution of individual banks. Therefore, macro-prudential regulation of banking system needs to be devised while assessing the systemic risk of bank for smooth banking operation in a country, like consider bank size, liquidity requirement, and asset structure to mitigate the systemic risk contribution. The study would helpful for regulators and policymakers, supervising financial institutions and banks to examine the indicators which likely to contribute in systemic risk of financial system and give attention to systemically important banks. Finally, regulatory authorities and policymakers must impellent policies for future to avoid systemic risk. Furthermore, study may provide the justification to design the banking system in compliance with the findings of this study to reduce the systemic risk contribution of the banking system.

References


An Investigation into the Impact of Power Outage on Working Capital Management in Textile Sector of Pakistan

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**ARTICLE DETAILS**

**ABSTRACT**

**Purpose:** Electricity is considered among one of the imperative resources for any firm which may have substantial influence on firm’s working capital. Acute power shortage is considered to have adverse effects on firm performance leading to reduced profits and improved working capital investment cycle, therefore it is imperative to analyze the effect of power shortage on the liquidity as well as profitability of the firm. The purpose of the current study is to explore the impact of power outage on firm’s working capital and profitability.

**Design/Methodology/Approach:** By employing financial data of 102 firms from Pakistan textiles sector for 13 years, the study incorporated panel data analysis to analyze the impact of power outage on working capital management and profitability of the firm.

**Findings:** The findings of the study showed that power shortage impacts working capital management of the Pakistan textile firms significantly. So, there is a need to arrange alternative energy sources which will result into savings from losses of sample firms.

**Implications/Originality/Value:** The current study is the first attempt with respect to emerging economies to determine the importance of working capital efficiency.

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Introduction
The importance of short-term financial decisions on firm’s profitability has been widely discussed in corporate finance literature (Anton & Nucu, 2021). As a buffer for the liquidity of the firm (Banos-Caballero et al., 2020), working capital (WC onwards) plays a substantial role during economic turmoil (Enqvist et al., 2014). In a recent report, it has been highlighted that efficiency of the working capital can lead towards an enhancement of 55% of capital investments (PWC Annual Report, 2019). Further, the report also highlighted that management of capital expenditures has become the important challenges for listed companies in the last five years. While, access to cash resources has become expensive and harder to convert, and working capital has improved only marginally. Keeping in view these findings, firm’s need to have efficient working capital culture as backing for the financial performance

WC is necessary to run the business operations and for attracting stakeholder’s investment. It is obligatory to retain solvency, liquidity and profitability of the firms (Raheman et al., 2010). Efficient and effective management of WC plays a central role in any business that cannot be denied. Prior studies explained that bankruptcy will be faced by the firms by ignoring its short-range capital needs and by heavy investment in long term (Aktas et al., 2015). So, balance should be maintained by the firms between liquidity and profitability.

Hence, the dearth of WC became the foremost reason for the collapse of various small businesses (Tufail, 2010). The management of WC is essential for firms for two major reasons; first company’s current assets and liabilities must be comprehensively handled to generate maximized revenue by reducing the risk of inability in meeting the daily expenditures for paying short term debts on the given deadlines. Secondly, a firm should start its business with easily available internal resources and it flourish to spend in short range productive assets so that the firm will be able to produce achievable earnings. It is mandatory for firm to run everyday procedures by keeping the equilibrium connection between liquidity and profitability.

Fundamental reasons of working capital management (WCM onwards) was creating steadiness between risk and return associated with the profitability of the firms (Tufail, 2010). Financial performance of the firm is commonly measured and indicated by profitability. Hence, statistical figures of profitability ratios are helpful in depicting the annual results of the overall operations performed by a firm during the whole year.

Main types of profitability ratios which are widely calculated are return on assets (ROA onwards), and return on equity (ROE onwards). Financial managers should also carefully made the decisions in the field of corporate finance because of its crucial importance to business in purpose to boost up the profitability by adopting effective and organized ways that make sure even management of business operational matters and raising funds (investment) for the business by focusing the interests of the stakeholders by keeping in mind the strategies of risk minimization and profit maximization.

Textile sector held a central position in the financial system of Pakistan. Textile sector is approximately contributing 9.5% to the GDP, 52% in the total exports and provides jobs to almost 15 million workforces (SECP, 2019). From last decade, several unfavorable circumstances included fluctuations in the global markets, political, economic instability and mainly devastating power failures had brutally challenged financial performance and productivity of the concerned sector of textile. Furthermore, production cost has also been raised through deficiency in the gas supply, increased petroleum prices and extensive load shedding (Ahmad & Bano, 2015). Deficient working capital and also its improper management has increased the debt and cost which became the reason of decline of productivity, liquidity and profitability in the textile sector which previously performed a vital role in developing the Pakistan economy.
Previously, Pakistan’s energy sector has been suffering power failures due to which it came under the state of disaster and currently the situation further has become most horrible due to extensive load shedding and un-announced power outages which negatively affected the social, organizational and economic development of the country. The crises of electricity are directly affecting our industrial infrastructure by interrupting their working capital, investment cycle and profitability ratios because of inadequate capacity of our production and distribution system. However, our industrial sectors and especially textile sector which acts as an engine of growth plays a vital role and contributes maximum to the GDP. As a matter of fact, the whole supply chain in textile sector right from spinning to weaving to processing and garmenting is disrupted and the situation is hampering export orders across the board. A past study depicted the importance of electricity and accessibility of electricity for any industrial sector in Pakistan and showed that production and consumption usage by the textile sector in various processes and provided the foremost reasons following the growing demand of electricity are rapid urbanization and industrialization.

Furthermore, the scarcity of electricity decreased the time of production and increased the cost of production of textile companies mainly due to load-shedding. Alternatively, companies produced, generated and looked for private electricity which badly affected their growth and efficiency due to increased cost of production resources. Textile sector has been extensively affected by the power crises and devastated the profitability by escalating the cost of production and expenses mainly because of immediate rise in fixed cost per unit of electricity and frequent shift to alternative sources of energy like generators and UPS (Shah et al., 2013). Past studies mentioned that electricity crises have adversely affect the textile firm’s performance due to the un-healthy Government policies, inflation, improper management of distribution system and inadequate capacity of production system to sufficiently supply the electricity as per the required quantity. As a consequence of power crisis, textile firm’s working capital, liquidity, profitability, efficiency, performance, growth, productivity and investment have also been influenced.

Keeping in view the above situation, it is clear that the persistent issue of electricity crisis greatly impacted the performance of textile companies by increasing the company expenses due to which their costs have exceeded their benefits in past few years. Hence, there is need to identify the effects of power failure on textile Sector’s liquidity and profitability by conducting an empirical study research on the textile sector.

The solution to the problem will provide information to the readers and guidelines to practitioners so that the financial ratios, working capital, investment cycle and revenues of the textile companies will be improved. The present research aims to emphasize the concern of electricity shortage towards listed textile company’s performance. In fact, no prior study has been conducted to analyze the differences between the pre and post-energy crisis affecting firm’s performance with the help of panel data in Pakistan for the time period starting from 2008 to 2020. On the basis of aim of the research, research objectives are specified as follows:

1. To observe the impact of power outage on liquidity of the textile companies.
2. To inspect the influence of power shortage on financial performance of Pakistani textile companies.

Literature Review

One of the influencing factors affecting the WC and profitability is electricity crisis. To cope up with the situation, when there is an electric shutdown, organizations go for the alternative sources like UPS and generators but this solution placed the firms under the burden of additional cost which decreased their profitability margins. Diverse researchers of multiple regions have
highlighted the problem of electricity crisis from different context. One stream of researches in this regard depicted that firms were enthusiastic to maximize their profits by minimizing their financing and investing cost to attain and maintain the appropriate and compatible level of capital structure through strategic and risk management techniques (Zeitun, 2007; Winston, 2013; Khan et al., 2013). Furthermore, other studies also highlighted some macroeconomic variables which affected firm’s financial position (Zeitun, 2007).

Earlier North American research on fusion of the outage cost was conducted stating the electric power industry had experienced increasing pressures to become more efficient and cost effective to provide service reliability to its customers for the same resource utilization. Resultantly, industry responded to the pressures by diverting their focus on utility planning, operations and pricing (Caves, 1990). Hence, small and local firms were more responsive whereas the foreign firms were less risky and reactive and showed financial limitations faced by firms (Guariglia, 2005). Electricity issues impacting Spanish organizations have raised the cost issues which consequently lead to depressing revenues (Albornoza, 2005). Interrelated research in Hungry identified the cost outages problem due to electricity shortfall. Hence, to handle with this electric shutdown problem, it privatized and liberalized its power sector with foreign capital which resulted in electricity surplus and significantly tariff cuts and ultimately increased the profitability margins (Bakos, 2001).

Previously in Nigeria, a research based on five-year trend analysis of 5 manufacturing companies was conducted by multivariate analysis and verified that each and every factor of WC varied textile firm’s remuneration. Consequently, combined WC factor effects could be ignored. Research suggested that companies needed proper plans for management of operations, adjustment of shortfalls, expert opinions for bring the improvement in the action plans for business purpose for the enhancement of profitability (Ajao, 2012). Commonly stated that balance between liquidness and profitability leaded to optimal WCM, therefore, a case study based on 386 Tunisian exports SME’s showed the pessimistic influence on the generated revenue by the WC factors. Hence, Tunisian small and medium-sized export-oriented Company’s net income can be further enhanced by reducing the days of stock account and receivable days (Bellouma, 2011).

Audretsch & Elston (2002) examined 100 firms in the Indian market and highlighted the significant determinants of corporate liquidity (cash flow, debt ratio, and free cash flow) for Textile and Chemical sector over the study period 1999 to 2008. Results verified that moderate size firms were more suitable for investing because of their liquidity edge contrasting to rest of the firm sizes and mentioned that emerging competition and internationalism had been improved for some of the companies approaching capital and investment features. Previously, in the textile sector of Bangladesh, a study has been designed and depicted the correlation of firm’s financial ratios, capital ratios and profit ratios.

It was observed from the primary data collection (questionnaire) that financial position and efficiency of textile firms were not suitable for achieving the required margins of profits. Results found the corresponding and strong effect of managing and working cycle capital on the net income (Rahman, 2011). Ahmad (2010) investigated that the main reason for prevailing electricity crisis in Bangladesh was due to organizational inefficiency, inadequate fund and weak governance. Privatization phenomena and policies related to public-private-partnership did not work to lessen the crisis and that’s why power crisis can be conquered via escalating the competence of energy and power sectors of government and not involving the governing bodies towards managerial actions and administrative strategies

Channar & Ram (2011) attempted case study on Fateh Textile industry by collecting the financial
Data through financial statements. Income statement analysis revealed that the rate of profitability of the Textile industry gradually fell down in the post period of calamity. Debt management analysis proved that creditors had given lesser amount in financing. At last, the results depicted that the number of sales of the particular industry was high in the pre period of disaster and number of sales decreased in the post period of disaster. Raheem et al., (2016) made survey on energy crisis in Pakistan and summarized that the natural reserves of producing energy (oil and gas) were going to be ended. Therefore, substitute resources of energy were desired to be explored to generate electricity from those resources to minimize the problem of electricity supply and shortfall. The inclusive cost effect of electricity blackout has been computed by many researchers on the Pakistan’s textile industry to set economic guidelines for value, penalty and electric management of load shedding and make procedures that how to make short term and long-term investments to have required supportive energy resources (Pasha, 1989).

Chisti (2013) revealed that the widespread power crisis is obstructing the textile mills through 16 to 18 hours of power distractions on a daily basis placing unpleasant impact on the industry’s sustainability, profitability and on gross domestic product affecting country’s economic development. Desk (2013) argues that the basis of the energy crisis was not the power deficit but the mismanagement in the power sector. Unscheduled load-shedding had stopped the progress of the production resulted into delays making export targets unachieviable, caused difficulty in assembling the domestic demand and consequently increased percentage of unemployment. Also, consumers in Pakistan pay higher tariffs as compared to other economies; therefore, electricity prices must be charged realistically.

A study conducted by Siddiqui (2004) for the evaluation of revenue generation in the energy sector and concluded that the revenue generated from electricity was not an income for the Government. Although the surplus from profit was kept for the investment and expansion activities in WAPDA and ultimately reduced the pressure on the Government funds because revenue shortfall in WAPDA was funded by the Government. Another study examined by Finance (2009) had drawn attention to the effects on the Textile Industry due to power crisis and global recession that Pakistan had faced. The hikes in electricity tariff, high input cost, internal dispute, subsidy removal and political instability which decreased the export revenue and increased level of unemployment are major determinants of elevated cost of production and manufacturing.

Previously a research on the Pakistan’s textile sector for the study period from 2005 to 2010 evidenced the bad influence of electric shutdowns on the company financial and liquidity ratios and after the crisis period, scenario became more worst changing the profitability measures of the textile firms presenting a declining trend in the post energy crisis period (Shah et al., 2013). Earlier in Pakistan in 2003 to 2008, one of the textile-based study depicted the fact of positive contribution of WC towards Firm’s earned income. Findings concluded positive connection among WC with profit and WC with control variables and indirect association between income and debt of the textile companies (Chhapra & Naqvi, 2010). Khan et al., (2013) studied the importance of stock returns in changing capital structure least square model was used to identify the results by taking stock return as dependent variable and following variables like ratios of leverage and ratios of earning and profitability were selected as independent components.

Linkage among the dependent and independent variables have been examined and showed that those independent variables have been directly linked to the dependent variables of stock returns. Bottom line of literature studies inferred that in Pakistan, more preference was given to the topic of managing profits and good capital organization for various industrial sectors but the particular industry of textile was not being greatly considered before for analyzing its importance towards economic development of our country. And it must be focused for studying that how the
concerned profitability generated by the sector of textile was being affected and what were the reasons behind this disaster. Therefore, identification gap must be filled up by conducting productive research including the current issue of power crisis to examine its influence on the liquidity and profitability in the industry of textile.

**Research Methodology**

Population comprises of textile sector of Pakistan; the sampling frame is actually based on 102 KSE listed textile companies extracted from the SBP published financial statements on the basis of data availability. Variables and their measurement is given below in tables 1, 2 and 3:

### Table 1: Expected Relation of WCR

<table>
<thead>
<tr>
<th>Variable</th>
<th>Symbol</th>
<th>Measurement</th>
<th>Expected Relation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Working Capital</td>
<td>WCR</td>
<td>CA/CL</td>
<td></td>
</tr>
<tr>
<td>Change in Expense ratio</td>
<td>CEXR</td>
<td>(LYE-CYE)/LYE</td>
<td>Negative</td>
</tr>
<tr>
<td>Leverage</td>
<td>LEV</td>
<td>TD/TA</td>
<td>Negative</td>
</tr>
<tr>
<td>Sales Growth</td>
<td>SAG</td>
<td>(LYS-CYS)/LYS</td>
<td>Positive</td>
</tr>
<tr>
<td>Size</td>
<td>SIZE</td>
<td>Log of TA</td>
<td>Positive</td>
</tr>
<tr>
<td>Tangibility</td>
<td>TAN</td>
<td>FA/TA</td>
<td>Negative</td>
</tr>
</tbody>
</table>

### Table 2: Expected Relation of ROA

<table>
<thead>
<tr>
<th>Variable</th>
<th>Symbol</th>
<th>Measurement</th>
<th>Expected Relation</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROA</td>
<td>ROA</td>
<td>NI/TA</td>
<td></td>
</tr>
<tr>
<td>Change in Expense ratio</td>
<td>CEXR</td>
<td>(LYE-CYE)/LYE</td>
<td>Negative</td>
</tr>
<tr>
<td>Leverage</td>
<td>LEV</td>
<td>TD/TA</td>
<td>Positive</td>
</tr>
<tr>
<td>Sales Growth</td>
<td>SAG</td>
<td>(LYS-CYS)/LYS</td>
<td>Positive</td>
</tr>
<tr>
<td>Size</td>
<td>SIZE</td>
<td>Log of TA</td>
<td>Negative</td>
</tr>
<tr>
<td>Tangibility</td>
<td>TAN</td>
<td>FA/TA</td>
<td>Positive</td>
</tr>
</tbody>
</table>

### Table 3: Expected Relation of ROE

<table>
<thead>
<tr>
<th>Variable</th>
<th>Symbol</th>
<th>Measurement</th>
<th>Expected Relation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Return on Equity</td>
<td>ROE</td>
<td>NI/TE</td>
<td></td>
</tr>
<tr>
<td>Change in Expense Ratio</td>
<td>CEXR</td>
<td>(LYE-CYE)/LYE</td>
<td>Negative</td>
</tr>
<tr>
<td>Leverage</td>
<td>LEV</td>
<td>TD/TA</td>
<td>Negative</td>
</tr>
<tr>
<td>Sales Growth</td>
<td>SAG</td>
<td>(LYS-CYS)/LYS</td>
<td>Positive</td>
</tr>
<tr>
<td>Size</td>
<td>SIZE</td>
<td>Log of TA</td>
<td>Negative</td>
</tr>
<tr>
<td>Tangibility</td>
<td>TAN</td>
<td>FA/TA</td>
<td>Positive</td>
</tr>
</tbody>
</table>

Panel regression is selected in which 102 textile companies have been contrasted with 13 financial years (2008-2020) as cross-section versus periods. The regression equations projected to be analyzed are as follows:

\[
WCR_{it} = \alpha_i + \beta_1 CEXR_{it} + \beta_2 LEV_{it} + \beta_3 SAG_{it} + \beta_4 SIZE_{it} + \beta_5 TAN_{it} + \epsilon_{it} \tag{Eq. 01}
\]

\[
ROA_{it} = \alpha_i + \beta_1 CEXR_{it} + \beta_2 LEV_{it} + \beta_3 SAG_{it} + \beta_4 SIZE_{it} + \beta_5 TAN_{it} + \epsilon_{it} \tag{Eq. 02}
\]

\[
ROE_{it} = \alpha_i + \beta_1 CEXR_{it} + \beta_2 LEV_{it} + \beta_3 SAG_{it} + \beta_4 SIZE_{it} + \beta_5 TAN_{it} + \epsilon_{it} \tag{Eq. 03}
\]

**Analysis and Findings**

Results and interpretations of regression analysis are given below. For equation 1, the results of panel regression show that adjusted R-squared is 0.706 indicating this model estimates 70.63% variance in dependent variable. The t-statistic for “CEXR” is -0.197 (p-value 0.84), showed this variable is insignificant. Alternative hypothesis is rejected based on p-value. The t-statistic for “LEV” is -0.07 (p-value 0.94), representing this variable as insignificant. The t-statistic for “SAGR” is 0.131 (p-value 0.8951), defining that the variable is insignificant. The t-statistic for “SIZE” is -0.062 (p-value 0.95), showed this variable as insignificant. The t-statistic for “TAN”
is 0.211 (p-value 0.83), showed this variable as insignificant.

**Table 4 - Results for Equation 1**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>9.976</td>
<td>90.73</td>
<td>0.10</td>
<td>0.91</td>
</tr>
<tr>
<td>CEXR</td>
<td>-0.337</td>
<td>1.71</td>
<td>-0.19</td>
<td>0.84</td>
</tr>
<tr>
<td>LEVR</td>
<td>-0.001</td>
<td>0.01</td>
<td>-0.07</td>
<td>0.94</td>
</tr>
<tr>
<td>SAGR</td>
<td>0.127</td>
<td>0.96</td>
<td>0.13</td>
<td>0.89</td>
</tr>
<tr>
<td>SIZE</td>
<td>-0.906</td>
<td>14.43</td>
<td>-0.06</td>
<td>0.95</td>
</tr>
<tr>
<td>TANR</td>
<td>3.054</td>
<td>14.43</td>
<td>0.21</td>
<td>0.83</td>
</tr>
</tbody>
</table>

All independent variables have exposed insignificant results individually stating that alternative hypotheses are rejected on the basis of t-value, the p-value is > 0.05. It is because that efficient level of WC should be managed for smooth operationalization of business. It can be concluded that maintenance of efficient level of WC is very important for textile sector. However, textile sector of Pakistan is on decline because of the additional operating and manufacturing costs increasing the injection for more WC into the firms to operate efficiently. Change in WCR also impacts the liquidity and profitability of the firm along with core capital structure depending upon the method through which new WC will be injected. It must be noted that there may be other factors besides mentioned in study models, that can clarify WCM and profitability association and this study is limited only to the effect of selected variables in measuring the efficiency of WCM depicting insignificant results.

In case of equation 2, the results of panel regression show that adjusted R-square is 0.517 showing 51.78% of variance. The value of F-statistic is 5.60 with a p-value of 0.00, also demonstrating this model as significant on the basis of p-value<0.05. Therefore, model is fully significant in equation 2.

**Table 5 - Results for Equation 2**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>7.44</td>
<td>16.41</td>
<td>0.45</td>
<td>0.65</td>
</tr>
<tr>
<td>CEXR</td>
<td>-0.57</td>
<td>0.31</td>
<td>-1.85</td>
<td>0.06</td>
</tr>
<tr>
<td>LEVR</td>
<td>-24.84</td>
<td>2.26</td>
<td>-10.98</td>
<td>0.00</td>
</tr>
<tr>
<td>SAGR</td>
<td>-0.21</td>
<td>0.17</td>
<td>-1.21</td>
<td>0.22</td>
</tr>
<tr>
<td>SIZE</td>
<td>3.23</td>
<td>2.61</td>
<td>1.23</td>
<td>0.21</td>
</tr>
<tr>
<td>TANR</td>
<td>-15.84</td>
<td>2.62</td>
<td>-6.04</td>
<td>0.00</td>
</tr>
</tbody>
</table>

The t-statistic for “CEXR” is -1.85 (p-value 0.06), stating this variable as insignificant because test statistic is < table value while p-value is > 0.05. The t-statistic for “LEVR” is -10.98 (p-value 0.00), indicating this variable as significant. The t-statistic for “SAGR” is -1.21 (p-value 0.22), proving this variable insignificant. The t-statistic for “SIZE” is 1.23 (p-value 0.21), proving this variable insignificant. The t-statistic for “TANR” is -6.04 (p-value 0.00), indicating this variable as significant.

Regression model for equation 2 is found to be significant and appropriate due to F-stat’s p-value that is p-value < 0.05 and coefficient of determination (R²) is 59.36 %. Whereas, the value
of t-statistic’s p-value for the three variables CEXR, SAGR, SIZE came up with unsupported findings rejecting the alternative hypothesis on the basis of p-value. No significant relation exists between CEXR and ROA, SAGR and ROA and SIZE and ROA. Statistical significant relation exists between LEVR and ROA and TANR and ROA as the statistical result between these two variables is significant. Panel regression results can be justified through literature by supporting the fact that when a company expenses increases its ROA decreases. Companies have to bear extra cost to maintain the electricity backups to do the production work in a flow but this burden of cost is only affordable by the large size of companies.

Hence, the size of the firm has positive and also negative relation with profitability (ROA) because of the reason that firm size matters in the issue of budgeting and funds availability. Same is the case in earlier research that more investments in fixed assets may generate more profits and ROA. As our results also show a positive relation between tangible assets and ROA. Also, if a firm deployed more resources in current assets then it will lead to wastage of resources. With the increase in leverage, there is a negative effect on profitability. Also, there is a substantial negative impact between total debts and profitability. These results are similar to the findings of Afzal, (2012) and Raheman, et al., (2010).

In case of equation 3, the results of panel regression show that Adjusted $R^2$ is 0.96. The t-statistic for “CEXR” is -0.74 (p-value 0.45), indicating this variable as insignificant. The t-statistic for “LEVR” is -127.07 (p-value 0.00), explaining this variable as significant. The t-statistic for “SAGR” is -0.46 (p-value 0.64), proving this variable “insignificant. The t-statistic for “SIZE” is -0.24 with a p-value of 0.80, indicating this variable as insignificant. The t-statistic for “TANR” is -2.97 (p-value of 0.003), indicating this variable as significant.

<table>
<thead>
<tr>
<th>Table 6 - Results for Equation 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dependent Variable: ROE</td>
</tr>
<tr>
<td>Method: Panel Least Squares</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>1.147</td>
<td>1.888</td>
<td>0.607</td>
<td>0.54</td>
</tr>
<tr>
<td>CEXR</td>
<td>-0.146</td>
<td>0.189</td>
<td>-0.745</td>
<td>0.45</td>
</tr>
<tr>
<td>LEVR</td>
<td>-0.044</td>
<td>0.000</td>
<td>-127.07</td>
<td>0.00</td>
</tr>
<tr>
<td>SAGR</td>
<td>-0.009</td>
<td>0.020</td>
<td>-0.460</td>
<td>0.64</td>
</tr>
<tr>
<td>SIZE</td>
<td>-0.073</td>
<td>0.300</td>
<td>-0.245</td>
<td>0.80</td>
</tr>
<tr>
<td>TANR</td>
<td>-0.893</td>
<td>0.300</td>
<td>-2.975</td>
<td>0.00</td>
</tr>
</tbody>
</table>

Research findings presented un-supported outcomes as a result of panel regression for equation 3 which has ROE as dependent variable. Prior studies supported the fact of insignificance by showing similar insignificant results. Data variation and unbalance data for the sample companies cause complexity in making significant results. For example, past publications presented that through the gradually increase in electricity crisis measured by change in expenses pushed the textile companies to pay additional electricity tariffs which enlarged their expenses and dumped down their returns and ROE. Alternative sources of energy can only be sustained by the large size firms and large size firms have diverse businesses so able to generate more profits and ROE and small size firms has more chances of risk as compared to returns.

In past, a research used ROE as proxy for profitability. A balanced panel dataset covering 160 textile firms for the period 2000 to 2005 is analyzed and used fixed effect model and founded that the textile firms show insignificant and weak positive rank correlation between the two ordinal scales devised for WCM factors in terms of control variables of firm size, leverage, sales growth, tangibility and profitability returns (ROE). To conclude, we infer that the textile industry has
established a weak positive rank correlation between working capital performance and profitability performance. The finding is still limited by the insignificance of the relationship, and could be attributed to chance (Danuletiu, 2010).

Leverage has negative relationship with all the predictor variables i.e. working capital, return on assets and return on equity. In case of working capital, total expenses payable decreases the working capital available to the company due to increase in long term liabilities of the company. Due to increase in leverage ratio of a company the outstanding expenses of the company increases, reducing the numerator (i.e. net income) in formulas of ROA and ROE resulting in decreased return. Sales growth increases the net income of the company increasing the return gained from the available asset and equity (ROA & ROE). Working capital available to the company increases due to increase in revenue and constant expense which would increase the cash in hand and current assets ultimately increasing the working capital of the company.

Size of the firm i.e. total assets of the company can impact our response variables significantly. Increase in the liquid assets has a direct positive impact on the working capital due to increase in company liquid resources. In case of return on assets, it will depend upon the type of assets acquired by the company. In case of purchasing productive assets which results in extra income, the return on asset ratio might stay stable or can increase depending upon the potential the new asset carries. If the indirect assets have been acquired by the company, it has negative impact on return on asset ratio.

The same scenario is applicable for return on equity. If ratio of fixed asset is increased in a company, it has a negative impact on the working capital due to flowing of liquid resources of the company toward fixed ones. In the case of ROA and ROE, as explained earlier the impact depends upon the type of asset acquired by the company, the return would increase in case of productive fixed assets and decreases in case of acquisition of non-productive assets (vehicles for employees, new office building etc.). If the variables of leverage, sales growth, size of the firm and tangibility have been controlled then their effect on the WCR and on the financial performance indicators would vary from small to large extent depending upon the features and size of the company.

The above results fully supported model significance which can be clearly confirmed through the value of $R^2$ for the respective three regression equations that are ($R^2$ for equation 1 is 75.25%, $R^2$ for equation 2 is 59.35 and $R^2$ for equation 3 is “96.9578”). Model significance and model supported results are verified by the F-statistic and p-values for all the three models are significant at the 5% significance level that is p-value<0.05. Consequently, both the p-values and $R^2$ values identified that all the three models are appropriate. However, justification for the unsupported results for the sub-hypothesis have been explained in detail theoretically in the section of panel regression results on the basis of literature studies. The detail of hypothesis testing for main hypothesis is given below in table 7:

<table>
<thead>
<tr>
<th>Table 7: Hypotheses Testing Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypotheses</td>
</tr>
<tr>
<td>H1</td>
</tr>
<tr>
<td>H2</td>
</tr>
</tbody>
</table>

The unsupported results for the main hypothesis can be justified with the help of literature that the performance in term of ROA & ROE has strong association with cost incurred which raised significantly due to electricity crises and ineffective management of net working capital in textile sector of Pakistan. Due to scarcity of resources, textile sector has to import its technical machinery, which also increases the cumulative cost of textile sector. Further, lack in
management of working capital, inflationary trend in fuel prices, massive electricity shortage, high cost of debt, tax system irregularities and other unseen factors bring negative impact on the performance of textile sector.

The major limitation of the proposed study is that the only 13 years financial data is used during the study due to the absence of financial data. This study has major implications for textile sector while it can also be conducted using different empirical models and variables like cash conversion cycle (CCC), average collection period, current assets and gross profit to further its scope. Research can also be made on financial sector which unexplored with respect to WCM.

References


Evaluating Moderating Effect of Growth Need Intent on Relationship between Job Characteristics and Job Satisfaction amongst Garments Industry Workers in Pakistan

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*Waheed Asghar, Director, Technical Education and Vocational Training Authority (TEVTA) Govt of Punjab, Lahore, Pakistan
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ARTICLE DETAILS

ABSTRACT

Purpose: The purpose of this research is to analyze the correlation between the job characteristics and satisfaction among production workers in the garments sector assembly line and also to examine the moderating impact of growth need intent on both variables. The five job characteristics were employed in this research.

Design/Methodology/Approach: This research was carried out in seven garment factories in Lahore. Data has been collected from production workers of different departments; cutting, sewing, pattern making, washing, pressing, packaging, and quality checking of randomly selected factories. A structured questionnaire was used for data collection. Considering the sample size estimation, the ratio has not to be below 1:5. (Hair, Black, Babin & Anderson, 2010) and 125 have been selected by a convenient method of sampling. Smart PLS has been used as a statistical tool for data processing and testing the hypothesis.

Findings: The research suggests two important findings. Firstly, the job characteristics significantly affect job satisfaction. Secondly, it shows that the relationship between job characteristics and satisfaction is significantly moderated by growth need intent. Implications/Originality/Value: This research will add value to the existing knowledge base and serve as a guideline for HR policymakers in the textile & garments industry to recognize the needs for the development of their workers.

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Introduction
The success of every organization depends primarily on its employees and their feeling for their work (Ali et al., 2014). Ketchain (2003) states that employees who were satisfied with their work were stressless rather energetic and happy. He also posits that happy workers were extremely satisfied with their job because they feel secure within their organization. Human resource is the most significant among other organizational resources like capital, land, machinery equipment and materials. Manufacturing companies must have an efficient human resource that can carry out duties effectively to achieve corporate objectives. An assembly line on a production floor is an arrangement of a repetitive task assigned to an employee to attain perfection and maximum productivity (Saheed, 2018). So, manufacturing through an assembly line is a technique implemented to increase production more effectively.

Job characteristics are the aspects of work that are intended to improve internal motivation and satisfaction among employees. (Hackman & Oldham, 1974). Research by (Hackman & Oldham, 1976) says growth needs strength to act as an efficient moderator between several variables. Job satisfaction is defined as how ample people like or dislike their jobs (Spector, 1997). Different studies indicate a positive relationship between job characteristics and job satisfaction (Matubber & Miah, 2001). Recent research by Yen, Yeh, & Lin 2007 has demonstrated that work satisfaction may be considerably increased by upgrading the work model. While discussing job efficiency and employee satisfaction issues, researchers generalized motivation theories (Shanum, 2011). Hackman & Oldham model can be used to predict whether a job redesign is possible to achieve good work and personal results (Hackman & Oldham, 1976).

Sector Background
Historically, a country's first successful industry was its garment industry, hence gradually brought other industries to grow (Muku, 2013). The textile industry of Pakistan expanded rapidly in the late 1970s. Pakistan is Asia's eighth-largest textile exporter. Pakistani textiles are exported worldwide. The Pakistan textile industry accounts for 8.5% of GDP (TDAP, 2016). The sector also employs approximately 45% of the total workforce of the country. The textile industry of Pakistan contributes 57% to the country's exports and employs 40% of its workers (Khawar et al., 2019). The ready-made garment is a growing textile industry in Pakistan.

Problem Statement
Pakistani garment industry can be classified as labor-intensive. Mostly production-oriented factories are focused with monitoring employee output. Like other labor-intensive manufacturing sectors, textile industry too has huge wage costs (Labour Survey of Pakistan, 2016). Manufacturing employees seem monotonous in assembly line tasks and have little chance of applying their other abilities and skills (Farooqui & Ahmed, 2013). The major purpose of this research is to investigate the job characteristics and efficacy of workers in Pakistan's garment sector, and to what extent is this model applicable to assembly line workers.

Research Questions
The current research will explore these research questions;

1. What is the relationship between job characteristics and job satisfaction in the ready-made garments sector in Lahore Pakistan?
2. Does employees’ growth need intent (GNS) influence the association between job characteristics and job satisfaction in the ready-made garments sector in Lahore Pakistan?
Literature Review
This section gives brief overview of different studies conducted in this area.

Job characteristics Model (JCM)
Hackman and Lawler first presented the job characteristics model in 1971. They established four essential job qualities in their model, namely diversity, autonomy, role identity, and feedback, however statistically, their results were not significant in quantifying the effect of job characteristics on absenteeism and turnover reduction (Hackman & Oldham, 1976). Hackman and Oldham's job characteristics theory (1974) tests the objective features of high-value work that improves employee well-being, motivation, and output. In addition, the model was built to characterize employee motivational features before job design and to recognize and calculate employee growth intensity (Hackman & Oldham, 1974).

Richard Hackman's and Greg Oldham's (1980) work characteristics model comprises of five elements. Skill identity is the degree to which a job needs a variety of tasks, including the skills and talents of the employee (Ali et al., 2014). Job identity permits a worker to perform all necessary tasks from start to end. Furthermore, the worker's feeling that it benefits their firm is known as job significance (Hackman & Oldham, 1976). When the work allows the individual the right to use his authority during decision making, it is autonomy (Buys et al., 2007). When workers are told about their work performance directly and clearly, it is known as job feedback (Hunter, 2006).

Job Satisfaction
Employment satisfaction was often described as the pleasant emotional state of assessing one's job or job experiences, which is prompted by the feeling that one's employment fulfils one's core work values, given that these values are compatible with one's needs (Rai & Maheshwari, 2020). Dissatisfaction happens when these values are not satisfied. Work satisfaction includes different characteristics; work satisfaction, salary, appreciation, supervisor-employee relationship and opportunity to achieve growth (Noe, 1985). Betts (2000) described job satisfaction as employee perception, defining the degree of satisfaction based on emotional needs.

Growth Need Strength
Hackman & Oldham (1976) opined that strength for growth refers to the desire of a person to be challenged and to grow in a job. People with high growth needs would react favorably to jobs that provide opportunities for professional development (Hidayah, Nadhir, & Puteh, 2017). On the other hand, people with less growth needs do not understand and appreciate the professional development opportunities (Lawrence, 2001). The strength needed for growth is how much individuals want to improve and generally do it (Saud, 2020). Psychologists who emphasize human potential contend that everyone has a minimum spark for personal growth and development (Sarkawi, Jaafar, Shamsuddin, & Rahim, 2017).

Relationship between Job Characteristics and Job Satisfaction
Job satisfaction derives from the understanding of the working atmosphere such as supervisors, management policies, working conditions, and allowances (Fauzan, 2020). When the growth needs of the employees were high, the correlation between work characteristics and job satisfaction was strongly positive (Rai & Maheshwari, 2020). The study revealed that workers are happy when they believe that their work is important (Obodo, Okonkwo, & Aboh, 2019). Job satisfaction describes the worker's contentment with his job and research posits that each of the five work attributes has been positive for work satisfaction (Sarkawi et al., 2017). A research by
Andrew, Haris, Zakariah, & Athirah (2016) postulated the effect on job satisfaction from work characteristics.

An employee is contented with his job if his income is sufficient, his task is appealing, working conditions are good and the work inspires his supervisors (Aloysius, 2013). It is important to minimize the factors that can reduce employee satisfaction (Raddaha et al., 2012). Based on the meta-analysis, it appears that shifts in employment have an impact on the connection between job qualities and well-being (Humphrey, Nahrgang & Morgeson, 2007).

Luthans (2006) states five factors influence the satisfaction of workers, specifically supervisors, salaries, opportunities to grow, and coworkers. The job model postulates that if all the elements are present at a job, the employee is more likely to be highly motivated, satisfied, rejuvenated with low absenteeism (Balkin, & Cardy, 2005). The definition of work characteristics was also viewed as an interpretation of employee satisfaction (Glisson & Durick 1988). Therefore, the following hypotheses are generated to analyze the relationship:

**H1:** Job Characteristics positively influence the job satisfaction of production workers of garments industry.

**Growth Need Intent as a Moderator between Job Characteristics and Job Satisfaction**

Growth need intent can be characterized as the strength of the personal achievement, learning, and development need of an individual. It has been described as a significant moderator on relationships between core jobs features and psychological states results (Saud, 2020). Psychologists who highlight individual development contend that everyone has at least a spark in him of personal growth and development (Senen, Masharyono, & Edisa, 2020).

Hackman and Oldham (1975) also maintain out that people with a low personal development need do not understand and acknowledge the possibilities available in the work (Sarkawi et al., 2017). They agree that those with high growth intent will react more favourably to jobs that are high in their core employment dimensions, as they provide opportunities for improvement.

In his research, Graen and Others (1986) found that employee growth need intent as a moderator between opportunities for growth and productivity. Growth intent means the desire of a person to grow in the job, to improve his skills and abilities and improved performance (Hackman and Oldham, 1980, p.85). The connections between job and result are determined by the growing need of the employee’s need for self-actualization and self-esteem (Hackman & Oldham, 1980). Therefore, the following hypothesis is suggested;

**H2:** The relationship between job characteristics and satisfaction is positively moderated by the growth need intent of production workers in garments industry.

**Research Framework**

This section presents the conceptual and theoretical framework of the research.
Conceptual Framework

Figure 1 Conceptual Model

Figure 1 presents the conceptual framework wherein job characteristics are regarded as an independent variable and job satisfaction is assumed to be a dependent variable. The moderator that affects the relationship between core job characteristics and job satisfaction is the growth need intent of workers.

Theoretical Framework

Job characteristics are called theories of job design designed by (Turner & Lawrence, 1965). The theory of job characteristics explains the individuals' work responses and their relationship with job features. The theory specifies the job state under which individuals are supposed to flourish in their work. The theory emphasizes that one of the most important outcomes is job satisfaction which gives quality work, effective performance, low absenteeism, and more revenue (Hackman & Oldham, 1980).

Research Methodology

This section describes the research methodology in detail.

Research Design

The research was cross-sectional and used a deductive method. The self-administered questionnaire was used to gather data from workers working in the textile & garments industry and the analysis unit was individual employees. The participants were production workers from different factories of garments industry in Lahore, Pakistan. A simple random sampling method is employed in this research. Data is collected from factory production workers by survey using a 7-point Likert scale questionnaire and analyzed using the PLS Smart (Ringle, Wende and Becker, 2015).

Questionnaire Development

Formerly established 18 items scale was used to assess work characteristics, job satisfaction, and growth need strength Likert scale has 7 points, ranging from strong disagreement to strong agreement. This research assessed job characteristics using a scale developed by Idaszak and Drasgow (1987) based on Oldham and Hackman's (1984) Job Diagnostic model. Growth needs strength and job satisfaction can be calculated by the Hackman - Oldham scale (1975). This measure was frequently employed in studies looking at the relationship between employment qualities and various results (Aloysius, 2011, Guise, 1988).
Assuming an accurate estimate of sample size, the ratio should not be less than 1:5. (Hair, Black, Babin & Anderson, 2010). In this research, three latent variables were used and, according to the rule of thumb, the minimum sample requirement was 90, depending on the item. Thus, based on this number, 125 questionnaires were distributed, of which 119 (95.2%) of the total responses received were considered to be good for the generalization of the result.

**Results and Analysis**

The questionnaire was tested with ten possible applicants to ensure its clarity before being administered to the proposed audience. Cronbach alpha is used to check the internal consistency of the model. Figure 2 presents the result of the model using partial least squares. Table 1 displays the Cronbach alpha value from the analysis. The literature proposes 0.6 as the acceptable value for Cronbach Alpha (Taber, 2018), which illustrates that the instrument used in this research is reliable and fit for analysis.

<table>
<thead>
<tr>
<th>Table 1: Value of Cronbach Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cronbach's Alpha</td>
</tr>
<tr>
<td>Growth Need Strength (GNS)</td>
</tr>
<tr>
<td>Job Characteristics (JC)</td>
</tr>
<tr>
<td>Job Satisfaction</td>
</tr>
</tbody>
</table>

The goodness-of-fit test is checked for an outer and inner model. It is used to prove the acceptance of goodness-of-fit for the outer model and inner model (Hair et al., 2014, p. 186).

![Image of Figure 2: Results Of Model Using Partial Least Squares]

**Goodness-of-fit test for outer model**

The convergent validity of the external model is assessed using a AVE rate and factor loading rate estimation of Tables 2 and 3.

<table>
<thead>
<tr>
<th>Table 2: Factor Loading for Outer Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Growth Strength (GNS)</td>
</tr>
<tr>
<td>Need Job Characteristics (JC)</td>
</tr>
<tr>
<td>Job Satisfaction</td>
</tr>
<tr>
<td>Moderating Effect 1</td>
</tr>
<tr>
<td>Indicator</td>
</tr>
<tr>
<td>-----------</td>
</tr>
<tr>
<td>GNS1</td>
</tr>
<tr>
<td>GNS2</td>
</tr>
<tr>
<td>GNS3</td>
</tr>
<tr>
<td>JC1</td>
</tr>
<tr>
<td>JC10</td>
</tr>
<tr>
<td>JC2</td>
</tr>
<tr>
<td>JC3</td>
</tr>
<tr>
<td>JC4</td>
</tr>
<tr>
<td>JC5</td>
</tr>
<tr>
<td>JC6</td>
</tr>
<tr>
<td>JC7</td>
</tr>
<tr>
<td>JC8</td>
</tr>
<tr>
<td>JC9</td>
</tr>
<tr>
<td>JS1</td>
</tr>
<tr>
<td>JS2</td>
</tr>
<tr>
<td>JS3</td>
</tr>
<tr>
<td>JS4</td>
</tr>
<tr>
<td>JS5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Growth Need Strength (GNS) * Job Characteristics (JC)</td>
<td>1.051</td>
</tr>
</tbody>
</table>

Source: Result with Smart PLS.

All of the indicators in Table 2 appear to be correct when it comes to determining convergent validity. AVE rates of all latent variables exceed 0.5, which indicates that all of these variables' hypotheses are accurate in relation to research methodology.

### Table 3: AVE for outer Model

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Average Variance Extracted (AVE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Growth Need Strength (GNS)</td>
<td>0.612</td>
</tr>
<tr>
<td>Job Characteristics (JC)</td>
<td>0.407</td>
</tr>
<tr>
<td>Job Satisfaction</td>
<td>0.404</td>
</tr>
<tr>
<td>Moderating Effect 1</td>
<td>1.000</td>
</tr>
</tbody>
</table>

Source: Result with Smart PLS.

Variables closely linked are tested using convergent validity methodology. The average AVE as shown in Table 3 measures convergent validity. If AVE is less than 0.5, but composite reliability is higher than 0.6, the convergent validity of the construct is still adequate (Fornell & Larcker, 1981).
Reliability test for outer model
An outer model can be verified by the total reliability in each latent variable. The effects of the research on reliability of outer model are seen in Table 4.

Table 4: Outer Model Composite Reliability

<table>
<thead>
<tr>
<th>Variable</th>
<th>Composite Reliability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Growth Need Strength (GNS)</td>
<td>0.822</td>
</tr>
<tr>
<td>Job Characteristics (JC)</td>
<td>0.871</td>
</tr>
<tr>
<td>Job Satisfaction</td>
<td>0.767</td>
</tr>
</tbody>
</table>

Source: Result with Smart PLS.

Inner model Goodness-of-fit test
The Inner Model Goodness-of-Fit test is based on the $R^2$ value. Table 5 shows that JC and even GNS moderation can account for 58.7 percent of the JS variance, with the remaining 41.3 percent explained by a variety of other variables. There is a good chance that the inner model is suitable for hypothesis testing now that the $R^2$ criterion has been met.

Table 5: $R^2$ Value for Inner Model

<table>
<thead>
<tr>
<th>Hypothesis test (JS)</th>
<th>$R^2$ Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>Job Satisfaction</td>
<td>0.587</td>
</tr>
</tbody>
</table>

Hypotheses are checked by the processing values obtained from the bootstrapping test (figure 3). The test was used to determine the acceptance and rejection of hypotheses based on data collected from the research. Table 6 is displaying the results of hypotheses determining the level of hypotheses by testing and seeing the value of path coefficient, t-tests.
Table 6: Hypotheses Testing

<table>
<thead>
<tr>
<th>SN</th>
<th>Hypothesis</th>
<th>Suggested</th>
<th>Path Coefficient</th>
<th>T-Value</th>
<th>Significant</th>
<th>Confirmed</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1</td>
<td>Job Characteristics positively influence the job satisfaction of production workers of the garment industry.</td>
<td>+</td>
<td>0.589</td>
<td>6.755</td>
<td>***</td>
<td>Yes</td>
</tr>
<tr>
<td>H2</td>
<td>The relationship between job characteristics and satisfaction is positively moderated by the growth need strength of production workers of the garment industry.</td>
<td>+</td>
<td>0.164</td>
<td>2.153</td>
<td>**</td>
<td>Yes</td>
</tr>
</tbody>
</table>

*Significance at 10% (1.645) p<0.10
**Significance at 5% (1.96) p<0.05
***Significance at 1% (2.576) p<0.01

As from table 6, the outcomes of the hypotheses are determined by considering the results of the T-tests, the path coefficients, and the significance levels. All hypotheses show a positive association with each other and significant varies at each association.

Discussion

The possible applicability of the Job Characteristics Model to manufacturing industries in the Pakistani context indicates that the model is not entirely unrelated to the nature of manufacturing work in the region. The model has proven useful in defining basic facts about different kinds of work. However, in some of the factories, the model falls short. These shortcomings cannot completely negate the model in the Pakistani context. It just means that the policy system has to be changed to fit the idea into the industry. Policy suggestions should also be made to resolve these areas of deficiencies of the Hackman and Oldham Job Characteristics Models.

The research reveals that workers in the textile & garments industry are satisfied with the identification of the task, the value of the task, the feedback for the activities, but are not satisfied with the range of autonomy and abilities. Employees in the textile and apparel industries have limited options when it comes to scheduling their time and determining how their work will be completed. The apparel industry's autocratic leadership affects employee productivity, commitment to goal fulfilment, job satisfaction, loyalty, and mental well-being. The research explains that it can be said that the implementation of skill varieties is missing for workers in the textile & garments field. This means that the rotation of jobs is not completed for employees. So, the different abilities, strengths, potentialities of the workers are overlooked here, and there is no opportunity for growth. This practice in the textile & garments industry reduces the chances of employees improving their careers and which makes them frustrated with their tasks. As a consequence, the productivity of workers, enthusiasm, and worker's morale is decreased.

Autonomy at work and facilities for the use of a range of skills by workers may be an important factor in the motivation and job satisfaction of workers. Organizations are also in charge of creating jobs and must devote enough resources to this task. Both variables are shown to be
positively linked and the findings suggest that the work characteristics and job satisfaction are important to each other, but the job description model is not followed and completely applied to produce the desired results. Growth has also been shown to have a positive effect on the relationship, but this aspect is not used to the desired degree in some of the factories. Training & development is a mechanism in which the skills of workers have been developed and are beneficial to the growth of workers, but this aspect is not utilized to the degree desired.

**Conclusion**

This study's findings suggest that job factors matter a lot when it comes to identifying differences and similarities among employees. The findings of this research showed that the job characteristics of employees had a significant relationship with their job satisfaction. Most employees do not understand work satisfaction and characteristics. It has been clear from the research that most of the workers with less education are satisfied with their tasks and don’t need any variety because assembly-line efficiency means profit and efficiency comes from working on the same task. Workers having some qualification and urge to grow wants variety in their task to upgrade their skills and career. Some of the female workers have no concern with job features, they are satisfied if the working environment is suitable for them.

It has been observed that the majority of employees are not happy with their salaries, incentive package, and other services. According to their thinking, wage and incentive packages would increase work satisfaction. In the data analysis, we discovered that despite not knowing about employment aspects, employees expect a variety of task fulfilment, autonomy, and variety at work, as well as feedback from their managers. These factors can have a good impact on employee happiness and productivity, as well as boost employee confidence and devotion to the company's goals. The research reveals that employees are happy with their job identity and job work satisfaction. They are dissatisfied with job variety and their less freedom. It’s heartening to see the contributions made by researchers in the realm of organisational motivation and job qualities, but it is worth noting that these ideas should be adapted to the needs of local workers organizations.

**Practical Implications**

Employee work satisfaction was found to be positively impacted by the basic job qualities of task variety, freedom, feedback, job involvement, and importance. HR managers can bring a wide range of variety by improving their skills. If the worker is familiar with various skills and methods his job can be changed. Skills can be improved by organizing training, workshops, etc. Employees must learn skills to develop his/her career. Managers should take into consideration and design adequate training for employees. The job identity is also increased by enhancing the skills of staff by training on latest machines and inclusion of additional duties or the upgrading of their tasks. Given the positive impact of task significance on job satisfaction, practitioners should concentrate on crafting jobs with high task importance. The focus of practitioners should be on delivering timely feedback to employees to increase productivity; achieve targets on time; minimize stress and better performance. Thus, in practice, changing the features of work can improve employment and increasing employees' enthusiasm and satisfaction.

**Significance & Recommendation**

Research into the impact of growth requires a stronger relationship between work characteristics and job satisfaction in the ready-made garment industry to fill a void that researchers have not filled. This paper represents a useful resource for practitioners and managers responsible for job responsibilities implementation because it demonstrates how they can get benefits from the new strategy and sustain the culture required to operate their processes. From a managerial point of view, the results connect theory to the model. Since the findings suggest that job characteristics tend to boost satisfaction, performance, and productivity. It is also suggested that HR managers
adapt the strategy to enrich jobs by making improvements in job characteristics to further enhance the level of satisfaction and motivation of employees.

References


Application of Logistic Regression on Passenger Survival Data of the Titanic Liner

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ARTICLE DETAILS

Purpose: This empirical research aims to predict the distinguishing variables of passengers who did or did not survive while traveling in the famous Titanic liner, which sunk in 1912.

Design/Methodology/Approach: The binary logistic regression analysis empirically analyzes the secondary dataset available for 1046 passengers. Variables such as passenger’s gender, age, family composition, ticket class, number of parents with/without children, and number of siblings and/or spouses were opted to examine the differences between the binary dependent variable (Passenger Survived/ Not Survived).

Findings: The study results indicate that all the variables are statistically significant in the model, with passenger's gender being the most significant predictor followed by passenger’s ticket class. The survival chances of passengers decreased for male passengers compared to their counterparts (female passengers) for the sample data [Exp(β)=0.080], for the passengers of age more than 21 years compared to passengers of age less than and equal to 21 years [Exp(β)=0.576], and for passengers with ticket class second and third compared to first-class ticket holders [Exp(β)=0.412]. In contrast, there was a greater chance of survival for families traveling together with parents, siblings, spouses compared to single travelers [Exp(β)=1.823].

Implications/Originality/Value: The study is a classic example of the application of binary logistic regression analysis using EVIEWS software.

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Introduction and Literature Review

On April 14th, 1912, the Titanic liner sank, killing 1523 people and leaving only 705 survivors. The goal of this study is to determine passenger survival using a data set of 1046 while considering the passenger’s gender, age, family composition, ticket class, number of parents with/without children, and number of siblings and/or spouses. The predictors are analyzed by applying the binary logistic regression analysis to determine their predictive value in the passengers' survival (binary response variable, survived=1, not survived=0). The membership group in the outcome variable and the change to the analytic strategy are two primary research concerns that emerge in binary logistic regression studies (Warner, 2012).

Brief technical analytics was performed considering logistic regression (LR) and its diverse application in the business domain using the Web of Science (WoS) database (Table 1). The period selected was from 1980 to 2021. The filter criteria applied restricted the search to research articles in the English language, only which yielded 289 research studies for analytics. Initially, the focus was on the Web of Science category in which the LR has been applied. The result reflects that 35.64% of research papers having logistic regression as the primary statistical inference technique are falling under ‘multidisciplinary sciences’. The next WoS category is ‘economics’ highlighting 21.10% of research articles. ‘Management’ is third in number having 16.27% of research papers bearing LR as the choice of statistical technique. The analytics of the WoS database yielded 25 primary categories but only the top three have been reported here.

Additionally, the ‘research area ‘was also explored. ‘Business economics’ is the top discipline where 40.5% of research work has made use of the LR technique. This is followed by the domains of ‘science technology’ and ‘social sciences’ with respective 35.64% and 14.18% research studies.

<table>
<thead>
<tr>
<th>#</th>
<th>Result Categories</th>
<th>Records</th>
<th>% of 289</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Multidisciplinary Sciences</td>
<td>103</td>
<td>35.64</td>
</tr>
<tr>
<td>2</td>
<td>Economics</td>
<td>61</td>
<td>21.10</td>
</tr>
<tr>
<td>3</td>
<td>Management</td>
<td>47</td>
<td>16.26</td>
</tr>
</tbody>
</table>

Researchers frequently use more than one response variable in their studies. There are situations where a standard set of predictor factors can predict several response variables (Breiman & Friedman, 1997). Like, the study of anxiety and depression illnesses. In modern western countries, mental diseases are quite common, and there is typically a significant degree of comorbidity among them. In the Netherlands, to be precise. Thus, data on a substantial number of respondents' personalities and mental problems were obtained in the Study for Depression and Anxiety (Penninx et al., 2008; Spinhoven et al., 2010).

In the study of drug consumption patterns, Fehrman, Muhammad, Mirkes, Egan, and Gorban (2017) are curious about the drug consumption profiles of their individuals and how they connect to personality traits like sensation-seeking and impulsivity. Therefore, they gathered information on the use of 18 different medicines.

The treatment effect is determined through clinical trials, where the outcome can be binary, i.e., cured or not cured. On the other hand, treatments can have side effects, categorized as present or absent. Therefore, it is critical to look at therapy and side effects simultaneously (Molenberghs & Verbeke, 2006).
Young adults are prone to psychosocial difficulties. The Strengths and Difficulties Questionnaire (SDQ), a relatively brief questionnaire, can screen for these difficulties in community settings, such as during large-scale general health check-ups. The SDQ is divided into two sections: self-report and parent-report. It should have good validity qualities; that is, it should anticipate specific psychosocial issues to be effective as a screening tool. Vugteveen, De Bildt, Hartman, and Timmerman (2018) looked at the SDQ's validity concerning four diagnoses.

Because the dependent variable is categorical and the independent variables (predictors) are continuous or discrete, the study demonstrates logistic regression analysis for research purposes. Furthermore, for special contextual reasons, the categorical dependant variable in logistic regression could be polytomous or multinomial (Meyers, Gamst, & Guarino, 2016).

**Methodology**

The data of the Titanic disaster of 1309 passengers for this study were accessed. The study utilized 1046 responses, and the sample with missing information was dropped from the analysis.

The criterion variable in this study, passenger’s survival is a binary response variable, survived=1, not survived=0, and the secondary data is analyzed by applying the binary logistic regression analysis to determine their predictive value of the set of predictors in the passengers' survival using EVIEWS software.

Validation is required for statistical models designed for prediction. For example, cross-validation involves randomly dividing the data into two halves, one for model building and the other for model validation. Validation approaches are also required when investigators want to see if a model built in another location (for example, a hospital or medical center) is suitable for predicting their environment; this is referred to as external validation (Miller, Hui, & Tierney, 1991).

One of the most often used tools for binary classification is logistic regression (Agresti, 2003; Berkson, 1953; Cox, 1958). The logistic regression model was established in the second part of the twentieth century, even though the logistic function has been known since the early nineteenth century (Cramer, 2002). Adaptations of logistic regression models have been devised to make them more flexible, for example, through base expansion, or less flexible, for instance, through regularisation (Friedman, Hastie, & Tibshirani, 2001).

An outcome or dependent variable \( Y_i \) is modeled as a linear function of a series of predictors \( X_1, X_2, \ldots, X_k \) using the equation \( Y_i = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_k X_k \) in ordinary least squares regression analysis (OLS). When the dependent variable is dichotomous and coded (0,1), the model is logit \( (Y) = \log\left(\frac{Pr(Y = 1)}{Pr(Y = 0)}\right) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_k X_k \) in logistic regression (Hosmer Jr, Lemeshow, & Sturdivant, 2013; Studenmund, 2014).

The independent variables chosen, among the other variables, in the study are presented in Table 2.

**Empirical Results and Discussion**

Table 3 presents the sample characteristics of 1046 passengers out of 1309 passengers from the Titanic disaster dataset.

<table>
<thead>
<tr>
<th>#</th>
<th>Description</th>
</tr>
</thead>
</table>

863
1. **Gender**
   - 0 = Female
   - 1 = Male

2. **Age**
   - 1 ≤ 21 years
   - 2 > 21 years

3. **Passenger Family Composition**
   - 1 = Travelling Alone
   - 2 = Travelling with spouses or siblings
   - 3 = Travelling with parents or children
   - 4 = Travelling with complete family (Siblings or spouses and parents or children)

4. **Ticket Class**
   - 1 = 1st class ticket
   - 2 = 2nd class ticket
   - 3 = 3rd class ticket

5. **Number of parents without/with kids**
6. **Number of spouses and or siblings**

The survival rate of passengers was only 40.8%, while 51.2% of the passengers perished in the famed shipping wreck of history. In the usable dataset of 1046 passengers for the study, 62.9% of passengers were male, while 37.1% were female. The dataset was divided into two age groups, i.e., age less than and equal to 21 years and more than 21 years for the present study, and the results suggest that 27.7% of the passengers belonged to the first category (aged ≤ 21 years) while 72.3% passengers from the second category, i.e., aged more than 21 years. Most passengers (48%) of the famous sinking incident were third-class ticket holders, 25% were second-class passengers, and 27% of passengers were first-class ticket holders (see Table 3).

### Table 3. Sample Characteristics

<table>
<thead>
<tr>
<th>Characteristics of Passengers (n = 1046)</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disaster Survival Status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Survived</td>
<td>427</td>
<td>40.8</td>
</tr>
<tr>
<td>Not Survived</td>
<td>619</td>
<td>51.2</td>
</tr>
<tr>
<td>Total</td>
<td>1046</td>
<td>100.0</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>658</td>
<td>62.9</td>
</tr>
<tr>
<td>Female</td>
<td>388</td>
<td>37.1</td>
</tr>
<tr>
<td>Total</td>
<td>1046</td>
<td>100.0</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤ 21 Years</td>
<td>290</td>
<td>27.7</td>
</tr>
<tr>
<td>&gt; 21 Years</td>
<td>756</td>
<td>72.3</td>
</tr>
<tr>
<td>Total</td>
<td>1046</td>
<td>100.0</td>
</tr>
<tr>
<td>Ticket Class</td>
<td></td>
<td></td>
</tr>
<tr>
<td>First</td>
<td>284</td>
<td>27.0</td>
</tr>
<tr>
<td>Second</td>
<td>261</td>
<td>25.0</td>
</tr>
<tr>
<td>Third</td>
<td>501</td>
<td>48.0</td>
</tr>
<tr>
<td>Total</td>
<td>1046</td>
<td>100.0</td>
</tr>
</tbody>
</table>

The results regarding the survival of passengers in Table 4 indicate that a greater number of female passengers survived the tragic event (62.9%) in comparison to male passengers (37.1%). Furthermore, Table 4 also reveals that most passengers from the age group of more than 21 years (72.3%) survived the unfortunate sinking of the Titanic in comparison to passengers aging less than and equal to 21 years (29.3%). Finally, passengers with a first-class ticket were at the top of surviving the catastrophe of the sinking of the Titanic with a survival rate of 42.4%, followed by 30.7% passengers holding a Third-class ticket and 26.9% passengers with a second-class ticket.

### Table 4. Survival Status
Characteristics of Passengers (n = 427)

<table>
<thead>
<tr>
<th>Gender</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>135</td>
<td>31.6</td>
</tr>
<tr>
<td>Female</td>
<td>292</td>
<td>68.4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>427</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Age</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤ 21 Years</td>
<td>125</td>
<td>29.3</td>
</tr>
<tr>
<td>&gt; 21 Years</td>
<td>302</td>
<td>70.3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>427</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ticket Class</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>First</td>
<td>181</td>
<td>42.4</td>
</tr>
<tr>
<td>Second</td>
<td>115</td>
<td>26.9</td>
</tr>
<tr>
<td>Third</td>
<td>131</td>
<td>30.7</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>427</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

To empirically test the objective of the present research, binary logistic regression was applied to the dataset. Table 5 describes the binary logistic regression analysis results in the current piece of research work. The passenger survival in the sinking of Titanic was the outcome variable (0-Not survived; 1-survived); passenger’s gender, their age, family composition, ticket class, parents’ children traveling along, and spouse/siblings traveling were taken to be the predictor variables.

The results indicate the statistically significant relationship of all the predictors and model significance at a 1% [χ²(6) = 436.606, p < .001]. Furthermore, the regression slope for gender, age, passenger ticket class, passengers traveling with or without their kids, and passengers traveling with spouses or siblings are negative, implying that probability of the survival of a passenger was higher for female passengers, passengers aged more than 21 years, and passengers with the first-class ticket.

Table 5. Binary Logistic Regression Analysis

<table>
<thead>
<tr>
<th>Predictor Variables</th>
<th>β</th>
<th>Wald Chi-Square Test</th>
<th>Exp(β)</th>
<th>% Δ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>-2.523***</td>
<td>216.100</td>
<td>.080</td>
<td>92%</td>
</tr>
<tr>
<td>Age</td>
<td>-.551***</td>
<td>7.959</td>
<td>.576</td>
<td>42.4%</td>
</tr>
<tr>
<td>Family composition</td>
<td>.601***</td>
<td>17.680</td>
<td>1.823</td>
<td>82.3%</td>
</tr>
<tr>
<td>tclass</td>
<td>-.887***</td>
<td>73.260</td>
<td>.412</td>
<td>58.8%</td>
</tr>
<tr>
<td>parch</td>
<td>-.430***</td>
<td>7.236</td>
<td>.650</td>
<td>35%</td>
</tr>
<tr>
<td>sibsp</td>
<td>-.646***</td>
<td>20.779</td>
<td>.524</td>
<td>47.6%</td>
</tr>
</tbody>
</table>

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

The logistic regression could use two indicators, such as Cox and Snell R² and Nagelkerke R², to check the variability in the outcome variable due to the predictors. It has been unanimously recognized that Cox and Snell R² indicator underestimates the real value (De La Viña & Ford, 2001; De Noble, Galbraith, Singh, & Stiles, 2007; Pituch & Stevens, 2015; Zewude & Ashine, 2016). The Nagelkerke pseudo R² indicates that 46% variation in the model is collectively explained by the set of predictors employed in the binary logistic regression model classifying the passengers who survived with those who did not.

The first predictor in the model, gender, had a negative sign for its partial slope coefficient is statistically significant at a 1% level of significance (β = -2.523; p-value = 0.000), indicating that a male passenger had a lower chance of survival. Gender is contributing the most in the model (Wald χ² = 216.10). Age predicts the membership group (survival) significantly at a significance level of 1% (β = -0.551; p-value = 0.005), having a negative partial slope coefficient implying that passengers falling in the age group of more than 21 years had a lower chance of survival. The third predictor, family composition of passengers is statistically significant at a 1% level of significance (β = 0.601; p-value = 0.000). Ticket class of passengers is also statistically
significant in the model at 1% level of significance ($\beta = -0.887; p$-value = 0.000). Finally, while family composition ($\beta = 0.601; p$-value = 0.000) is positive, implying probability of survival was higher for a passenger traveling alone.

The null hypothesis for statistical significance testing of independent variables used in the study is that each independent variable is unrelated to the log odds ratio outcome variable. The null hypothesis test in logistic regression is the Wald $\chi^2$ statistic explains the projected change in log-odds for each 1-unit change in the predictor variable (Warner, 2012).

Pampel (2000) proposed that the formula for the distance of Exp ($\beta$) from 1 shows the effect size. The score of the independent variable increases by one unit, the percentage change in the odds ratio is easily determined in percentage terms. Furthermore, Thompson (1999) and Kirk (2003) emphasized that researchers should carefully evaluate each independent variable's effect size and strength used in the model to ensure that it is substantial enough to be regarded as meaningful and practically significant.

Table 5 provides the odds of passenger survival [see Exp($\beta$)]. For example, the odds of survival of passengers decrease by 92% for male passengers compared to their counterparts (female passengers) for the sample data [Exp($\beta$)=0.080], the probability of survival of passengers aged more than 21 years compared to passengers of age 21 years decreased by 42.4% [Exp($\beta$)=0.576]. Furthermore, the probability of the survival of passengers with a greater ticket class decreases by 58.8% [Exp($\beta$)=0.412]. Moreover, the likelihood of survival of passengers traveling together with parents, siblings, spouses increases by 82.3% compared to single travellers [Exp($\beta$)=1.823].

Conclusions
In the present study, the authors developed a binary logistic regression function to distinguish from a set of factors of passengers traveling on the Titanic liner who survived or did not survive the catastrophe. This research concludes that all the six predictors, passenger’s gender, age, family composition, ticket class, passengers traveling with or without their kids, and passengers traveling with spouses or siblings were significantly contributing in determining the inter-group differences implying that the passengers who survived the sinking of the Titanic were linked with their gender, their age group, their family composition, ticket class, number of children accompanying their parents and number of sibling and spouses accompanying passengers. The binary logistic regression model with survival as a binary dependent variable has 46% variance with the set of predictors employed.

References


Impact of Service Quality and Price Fairness on Consumer Loyalty: The Moderating Role of Information Literacy

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Samia Zarrar, National College of Business Administration & Economics (NCBA&E) Lahore, Multan Sub-campus, Pakistan
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ARTICLE DETAILS

ABSTRACT

Purpose: Using data from 200 hotel guests in Multan, Pakistan, this research aims to evaluate the influence of service quality and pricing fairness on consumer loyalty while moderating the role of information literacy.

Design/Methodology/Approach/Findings: The findings are estimated using partial least square (PLS). The variables service quality, pricing justice, and information literacy are all positively and substantially connected to customer loyalty, according to PLS estimations. Because the link between service quality and customer loyalty is statistically significant, the results of the moderated regression demonstrate that information literacy positively moderates it. On the other hand, while the link between price fairness and customer loyalty is statistically significant, the variable information literacy acts as a negative moderator.

Implications/Originality/Value: Hotel management are advised to invest in and increase the quality of service. Managers must maintain control of all activities related to the concept of quality from the bottom to the top of their business.
quality on the profit and financial outcomes of the company. The relationship between service quality and benefit is yet unknown. Customer happiness and loyalty retention are challenging to achieve.

Because of the intense rivalry and the adversarial mood of natural components, service quality has become a straightforward advertising method for businesses. This demonstrates how critical it is for businesses to improve service quality in order to ensure their long-term viability and development, as it will enable them to deal with the dangers they face in today's competitive marketplaces (Joudeh & Dandis, 2018). Customer loyalty, according to Naik et al. (2010), may be impacted by a variety of factors. Service quality, rather than product excellence, is appreciated and sought after. Customers' faith in service is not only based on service outputs, but it is also maintained as long as the service is provided. To begin, consider how employees interact and behave throughout the transaction process. Furthermore, strong service quality will be considered as a measure of ensuring the company's survival and development.

The company's reputation would be enhanced by high service quality. Services are a developing process of continual customer-service encounters that include a variety of intangible activities supplied as premium solutions to customer difficulties, as well as physical and financial instruments and all other important framework pieces involved in the supply of these services (Gronroos, 2004). Customer loyalty and quality of service are critical principles that businesses must consider in order to stay focused on their company and develop it. Companies must evaluate how to assess these structures from the perspective of consumers, with a clear end goal in mind, in order to fully comprehend and meet their expectations. The importance of service quality is recognized since it leads to increased customer loyalty, profit, lower costs, customer commitment, and maintenance (Joudeh & Dandis, 2018). According to Chingang and Lukong, the entire assessment of service by consumers is the quality of service (2010).

Customer loyalty is seen to be a construct made up of both the customer's attitude and behaviors. The consumer's attitude reflects principles such as the desire to repurchase or buy additional goods or services from the same brand, the ability to refer the company to others, the demonstration of such loyalty to the company by demonstrating an aversion to switching to a competitor, and the willingness to pay a higher price (Cronin & Taylor, 2007). Consumer loyalty's behavioral component, on the other hand, is the actual recurrent purchase of goods or services, which comprises buying more and different items or services from the same firm, endorsing the company to others and indicating the probability of the brand's long-term preference. Consumer loyalty, it might be assumed, symbolizes the anticipated activities linked with the product, service, or company. Customer happiness is seen as a critical component of long-term market expansion (Donnelly, 2009).

This research seeks to evaluate the influence of service quality on customer loyalty in the hotel business of Pakistan, mitigating the effect of information literacy, after providing theoretical correlations between service quality and consumer loyalty. The hotel sector has grown to be the most well-known on the planet. In the hotel industry, restaurants, rooms, and health clubs are no longer considered luxury facilities. These services are a necessary element of many people's everyday life. The hotel industry's services have changed dramatically during the last two decades, moving from traditional to contemporary conditions. Passenger growth has been encouraged by the supply and demand for hotel sector services, and the industry is becoming more competitive. The most pressing challenge confronting the hotel sector today is the growing volume and pace of competition (Saleem & Raja, 2014).

Significance of the Study
Hotel executives feel that the greatest way to make income is to please consumers. According to
the bulk of empirical research, just delighting clients does not guarantee that they will remain with you or utilize your services in the future. In terms of corporate success, only customer loyalty is more crucial than customer satisfaction. The price paid by hotels, on the other hand, is a significant factor that may have a favorable or negative influence on marketing activities. The goal of this study is to see how service quality and pricing justice affect customer loyalty in the Pakistani hotel industry. The hotel industry is a fast-increasing sector across the globe, and no one has given much attention to performing research on it until lately. As a consequence, we investigate the influence of service quality and pricing fairness on customer loyalty in the Pakistan hotel industry, as well as the moderating function of information literacy.

Literature Review
This section provides the definitions and literature on theoretical link between variables.

Service Quality
A service is an economic activity that provides customers with additional value and benefits at certain times and places by creating a desired change in or on behalf of the service receiver. Despite the fact that the process is related to a physical product, the performance is fleeting, often intangible, and seldom results in ownership of any of the production factors (Lovelock & Wirtz, 2004). Meeting specified expectations, on the other hand, demonstrates to the customer the product or service's worth (or quality), including its economic value, safety, reliability, and maintainability.

According to Parasuraman et al. (1988), service quality is defined as the gap between customer demands and service experiences in order to gain a strategic advantage. This implies that delivering excellent service requires consistently meeting client expectations, which may be assessed by determining if the delivery of perceived service meets, exceeds, or fails to meet customer expectations.

Consumer Loyalty
Consumer loyalty has been a significant idea in marketing during the past decade, especially in the quickly increasing area of customer relationship management. Customer loyalty may be described in two different ways. To begin with, loyalty is a mindset. Different emotions determine a person's eventual association with a product, service, or organization. These feelings define an individual's (purely cognitive) level of loyalty. Behavioral loyalty is the second kind of loyalty. Loyalty activities include things like continuing to purchase services from the same supplier, expanding the size and/or reach of a relationship, or making a proposal (Yi, 1990). Neal (1999) defined customer loyalty as the percentage of times a buyer selects the same product or service in a certain category compared to the entire quantity of transactions done in that category by the consumer, assuming that other.

Price Fairness
Price fairness, according to Xia et al. (2004), is the customer's assessment of whether the gap (or lack thereof) between a seller's price and the price of a similar party is reasonable, justified, or justifiable. Customers, on the other hand, sense market injustice since they pay greater prices than competitors. Price is one of the most important parts of the marketing mix, as well as other marketing mix elements, and has a significant impact on customer purchase choices (Kotler et al., 2012).

Information Literacy
Information literacy is defined as the ability to locate, examine, critically evaluate, and use information to solve problems in a number of contexts, including school-based independent project work. We think that the emphasis on locating and choosing information sources in
various information literacy programs reflects a long history of library use instruction that has primarily focused on sources, search tactics, and information assessment (Bawden, 2001).

**Relationship between Service Quality and Consumer Loyalty**

Fida et al. (2020) discovered that respondents gave a "Agreement" answer on average in the five domains of tangibles, responsiveness, dependability, assurance, and empathy. The correlation data demonstrated a substantial relationship between the three variables: degree of service, customer satisfaction, and customer loyalty. Kumar et al. (2019) discovered that quality offers in the telecoms industry had not only a positive but also a significant impact on customer pleasure and loyalty. The impact of service quality on customer loyalty was investigated by Ajmal et al. (2018). In Pakistan's banking industry, the research shed light on the impact of service quality on consumer satisfaction. Customer loyalty has a supporting and significant link with components of service quality such as tangibility, empathy, and certainty, according to the study's results. According to Dubey and Srivastava (2016), the consistency of the service has a significant and positive impact on the preservation of client relationships and satisfaction. Across the four antecedents of service efficiency, tangibility and assurance have a considerable and favorable influence on the management of customer relationships, while tangibility has a big impact on customer loyalty.

Firend and Abadi (2014) looked at the impacts of service efficiency, confidence, and customer perceived value on customer loyalty in the Malaysian business sector. The research found that there was a positive association between service quality and confidence, service quality and perceived value, trust and consumer loyalty, and perceived value and customer loyalty. According to the findings, customer service, confidence, and perceived value are all seen to be antecedents of client loyalty. Poku et al. (2013) investigated how service quality influences customer loyalty in Ghana. The results confirmed the existence of a clear correlation between customer satisfaction and loyalty. Because consumers have grown less satisfied with it and are more inclined to take it for granted in their search for development, "tangibility" does not play a vital role for all hotels in growing consumer contentment. According to the findings, hotel categorization may not be only based on physical factors, but rather on a full service that provides value for money and influences customer loyalty. In Penang, Malaysia, Kheng et al. (2010) investigated the impact of service quality on customer loyalty among bank clients, with customer satisfaction mediating these factors. The findings showed that improving service quality might boost consumer loyalty. The service efficiency elements that played a crucial influence in this computation were reliability, empathy, and assurance. The findings revealed that the bank was seen well by the general public, but that there was still potential for improvement.

**Relationship between Price Fairness and Consumer Loyalty**

Price perceptions have long been examined in several fields of social science, such as marketing and economics. It is commonly understood that a client's pricing experience may be assessed in two ways: it either increases or decreases customer loyalty, which leads to useful behaviors (Leinsle et al., 2018). For example, Konuk (2018) looked at the impact of pricing expectations on customer loyalty and buying behavior. According to the results of the research, people's concept of price justice has a favorable impact on their willingness to pay more for satisfying experiences. The lower the price perception, the lower the commodity perception of sacrifice, according to Bei & Chiao (2001). Customers may be more comfortable with their comprehension of expenses and the entire transaction if this is done. This suggests that monetary prices or price expectations do not boost pleasure naturally. Customers often correlate prices with service efficiency based on the idea of equality, resulting in consumer happiness or disappointment.

Susanti (2019) used customer satisfaction in budget hotels in East Java to investigate the influence of service quality and perceived price fairness on consumer loyalty. The outcomes of
the research show that, first and foremost, the quality of service has a positive and significant influence on customer loyalty. Second, customers’ perceptions of pricing fairness have a significant impact on their loyalty. Second, client retention has a significant and positive influence on customer engagement. Fourth, service efficiency has a favorable and substantial influence on client loyalty via customer satisfaction. Fifth, customer satisfaction's perception of pricing fairness has a favorable and substantial influence on customer loyalty. Cakici et al. (2019) looked at the relationships between perceived price justice, satisfaction, revisit intention, and loyalty, emphasizing on the role of revisit intention as a mediating factor in the relationship between perceived price justice, contentment, and loyalty. Pricing justice and satisfaction have a good influence on restaurant customers' return intention, and revisit intention has a positive impact on restaurant customers' loyalty, according to the findings of structural equation modelling. According to the data, whereas revisit intention completely mediates the influence of price justice and loyalty, it only partly mediates the effect of satisfaction and loyalty.

**Relationship among Service Quality, Price fairness, Customer loyalty & Information literacy**

Information literacy is defined as the ability to locate, examine, critically evaluate, and use information to solve problems in a number of contexts, including school-based independent project work. We think that the emphasis on locating and choosing information sources in various information literacy programs reflects a long history of library use instruction that has primarily focused on sources, search tactics, and information assessment (Bawden, 2001). This makes it possible for researchers to be lifelong learners. Only a few sectors of study have employed this powerful method that not only differentiates unauthentic material from authentic knowledge. The goal of this study is to get the most out of this holistic approach to learning in the area of customer service. It is estimated that information literacy would help consumers grasp the sensitive nature of service quality while also assisting service providers in making their clients aware of the aspects of their products (tangible or intangible).

Educating customers about service quality and pricing fairness helps service providers in removing misconceptions and confusions regarding service quality. It automates the conversion of a retained client into a loyal customer in some way. Once a consumer is completely informed about all aspects of pricing fairness and service quality, he or she is no longer necessary to be attended to from the beginning on each transaction. An information literate client may do a self-analysis for the comparative amount spent on a given product and its perceived value if there is a price increase or change.

**Conceptual Framework**

Following the literature review this study developed a theoretical framework presented in Figure 1. Figure 1 shows the theoretical model of this research. The dependent variable used in a study is customer loyalty while independent variables are price fairness and service quality. The moderation variable is information literacy.
Methodology

Population and Sampling Design
The customers of all operational top category outlets existing in the hotel industry (food and beverage) of Multan city are included as the population in the study. The data of 200 customers of hotels in Multan city are collected by using non-probability convenient sampling technique. Sample size will be 10% of hotel industry’s consumers in Multan. This sampling ratio was used by (Kang, Stein, Hoe, Lee 2012), in a similar study. The amount of ten hotels (food and beverage) is selected for data collection by using a convenient sampling technique.

Model Specification
Two models are developed to analyze the impact of service quality and price fairness on consumer loyalty by moderating the impact of information literacy.

Model-I: Examines the Impact of Service Quality, Price Fairness, and Information Literacy on Consumer Loyalty
CONL = β₀ + β₁SQL + β₂PRF + β₃INFL + uᵢ

Where:
CONL = Consumer loyalty
SQL = Service quality
PRF = Price fairness
INFL = Information literacy
uᵢ: error term

Model-II: Examines the Impact of Service Quality, and Price Fairness on Consumer Loyalty: Moderating the Role of Information Literacy
CONL = β₀ + β₁SQL + β₂PRF + β₃INFL + β₄SQL*INFL + β₅PRF*INFL + uᵢ

Where:
CONL = Consumer loyalty
SQL = Service quality
PRF = Price fairness
INFL = Information literacy
SQL*INFL = Interaction term of service quality and information literacy
PRF*INFL = Interaction term of price fairness and information literacy
uᵢ: error term

Table 1: Description of Variables

<table>
<thead>
<tr>
<th>Variables</th>
<th>Description of Variables</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Dependent Variable</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CONL</td>
<td>Consumer loyalty</td>
<td>Measure by five-point Lickert scale it consists of six statements that were also used by Dehghan &amp; Shahin, (2011)</td>
</tr>
<tr>
<td>Moderating Variable</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
INFL Information literacy Measured with a five-point Lickert scale that was developed by Pinto, (2010). Information literacy consists of five statements

**Independent Variables**

<table>
<thead>
<tr>
<th>SQL</th>
<th>Service quality</th>
<th>Measured with a 5-point Lickert scale that consists of eight items that were developed by Parasuraman et al. (1988).</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRF</td>
<td>Price fairness</td>
<td>Measured with a five-point Lickert scale that consists of four statements and also used by Darke &amp; Dahl, (2003).</td>
</tr>
</tbody>
</table>

**Hypothesis Development**

Based on the literature the following research hypotheses are developed:

H1: The impact of service quality on consumer loyalty is positive.

H2: The impact of information literacy on consumer loyalty is positive.

H3: The impact of price fairness on consumer loyalty is positive.

H4: Information literacy moderates the relationship between service quality and consumer loyalty

H5: Information literacy moderates the relationship between price fairness and consumer loyalty

**Methodological Issues**

Different econometric techniques are applied to attain the objectives of the study. Confirmatory factor analysis (CFA) is conducted to observe the measurement model which consists of Cronbach’s Alpha, rho_A, composite reliability and average variance extracted (AVE). The Cronbach’s Alpha value should be greater than 0.70. The value of composite reliability should be greater than 0.60 (Fornell, & Larcker, 1981) while the value of average variance extracted should be greater than 0.50 (Hair et al. 2014). Partial least square method is used to assess the impact of service quality and price fairness on consumer loyalty by moderating the role of information literacy. When using PLS-SEM, researchers must go through a multi-stage procedure that includes defining the inner and outer models, collecting and examining data, estimating the model, and evaluating the findings (Hair et al. 2014).

**Descriptive Analysis**

This section explains the descriptive statistics of variables in terms of minimum value, maximum value, the mean and standard deviation of a variable. Table 2 demonstrates the descriptive statistics of variables.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>S.D</th>
<th>Kurtosis</th>
<th>Skewness</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGE</td>
<td>23</td>
<td>52</td>
<td>35.01</td>
<td>5.636</td>
<td>0.661</td>
<td>3.731</td>
</tr>
<tr>
<td>INC</td>
<td>20000</td>
<td>95000</td>
<td>41343</td>
<td>13475</td>
<td>1.795</td>
<td>6.665</td>
</tr>
<tr>
<td>EDU</td>
<td>10</td>
<td>18</td>
<td>15.59</td>
<td>1.436</td>
<td>-1.227</td>
<td>5.906</td>
</tr>
<tr>
<td>CONL</td>
<td>13</td>
<td>30</td>
<td>24.51</td>
<td>3.780</td>
<td>-0.880</td>
<td>2.733</td>
</tr>
<tr>
<td>SQL</td>
<td>11</td>
<td>40</td>
<td>32.16</td>
<td>7.177</td>
<td>-1.423</td>
<td>3.931</td>
</tr>
<tr>
<td>INFL</td>
<td>11</td>
<td>30</td>
<td>23.97</td>
<td>4.761</td>
<td>-1.220</td>
<td>3.510</td>
</tr>
<tr>
<td>PRF</td>
<td>6</td>
<td>20</td>
<td>15.65</td>
<td>2.842</td>
<td>-1.228</td>
<td>4.306</td>
</tr>
</tbody>
</table>

**Source:** Author’s Calculations

**Correlation Analysis**

Table 3 shows that consumer loyalty is positively correlated with service quality (0.856), information literacy (0.891), and price fairness (0.668).

<table>
<thead>
<tr>
<th>Variables</th>
<th>CONL</th>
<th>SQL</th>
<th>INFL</th>
<th>PRF</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONL</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SQL</td>
<td>0.856**</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>INFL</td>
<td>0.891**</td>
<td>0.912**</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

**Table 4.29:** Correlation Matrix
Measurement Model
Measurement model consists of confirmatory factor analysis and factor loadings.

Construct Reliability and Validity
Confirmatory factor analysis (CFA) is conducted to observe the measurement model which consists of Cronbach’s Alpha, rho_A, composite reliability and average variance extracted (AVE). The Cronbach’s Alpha value should be greater than 0.70 and it is found that alpha value of all the variables is greater than 0.70. The value of composite reliability should be greater than 0.60 (Fornell & Larcker, 1981) while the value of average variance extracted should be greater than 0.50 (Hair et al. 2014). The outcomes show that the value of composite reliability and average variance extracted is above the threshold levels. So we can conclude that the data used in a study for analysis is reliable.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Cronbach's Alpha</th>
<th>rho_A</th>
<th>Composite Reliability</th>
<th>Average Variance Extracted (AVE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONL</td>
<td>0.811</td>
<td>0.844</td>
<td>0.875</td>
<td>0.64</td>
</tr>
<tr>
<td>INFL</td>
<td>0.905</td>
<td>0.914</td>
<td>0.929</td>
<td>0.725</td>
</tr>
<tr>
<td>PRF</td>
<td>0.758</td>
<td>0.819</td>
<td>0.859</td>
<td>0.673</td>
</tr>
<tr>
<td>SQL</td>
<td>0.953</td>
<td>0.958</td>
<td>0.961</td>
<td>0.755</td>
</tr>
</tbody>
</table>

Variables Description
CONL: Consumer Loyalty, INFL: Information Literacy, PRF, Price Fairness, SQL: Service Quality

Source: Author’s Calculations

Factor Loading
Factor loadings indicate that items of a construct are highly correlating with each other. The value of factor loading should be greater than 0.60 (Hair et al. 2007). If the value of factor loading is found to be less than 0.60 it indicates that items of one construct are correlating with items of other construct and not measuring the desired construct. This situation is considered as an issue and not acceptable. If items have factor loading less than 0.60 it should be excluded. Table 5 presents the factor loadings. Outcomes show that most of the items have factor loading value greater than 0.60 but few have value less than 0.60. So that items having factor loading value less than 0.60 is excluded from the study.

Table 5: Factor Loading
<table>
<thead>
<tr>
<th>Variables</th>
<th>Factor Loading</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Consumer Loyalty</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I use products/services from the company because it is the best choice for me</td>
<td>0.572</td>
<td>Rejected</td>
</tr>
<tr>
<td>I intend to keep buying the products/services from the company</td>
<td>0.722</td>
<td>Accepted</td>
</tr>
<tr>
<td>The company is different from competing brands</td>
<td>0.782</td>
<td>Accepted</td>
</tr>
<tr>
<td>I say positive things about the company to other people</td>
<td>0.741</td>
<td>Accepted</td>
</tr>
<tr>
<td>I have a positive emotional relation to the company I have chosen and I feel attached to it</td>
<td>0.862</td>
<td>Accepted</td>
</tr>
<tr>
<td>I consider myself to be a loyal patron of the company</td>
<td>0.509</td>
<td>Rejected</td>
</tr>
<tr>
<td><strong>Information Literacy</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I use printed sources of information</td>
<td>0.890</td>
<td>Accepted</td>
</tr>
<tr>
<td>I enter and use automated catalogues</td>
<td>0.826</td>
<td>Accepted</td>
</tr>
<tr>
<td>I consult and use electronic sources of primary information</td>
<td>0.768</td>
<td>Accepted</td>
</tr>
<tr>
<td>I use electronic sources of secondary information</td>
<td>0.510</td>
<td>Rejected</td>
</tr>
<tr>
<td>I search for and retrieve internet information</td>
<td>0.903</td>
<td>Accepted</td>
</tr>
<tr>
<td>I use printed sources of information</td>
<td>0.807</td>
<td>Accepted</td>
</tr>
<tr>
<td><strong>Price Fairness</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The price I paid was fair.</td>
<td>0.727</td>
<td>Accepted</td>
</tr>
<tr>
<td>The price I paid was justified.</td>
<td>0.513</td>
<td>Rejected</td>
</tr>
<tr>
<td>I am happy with my purchase decision.</td>
<td>0.846</td>
<td>Accepted</td>
</tr>
<tr>
<td>The price I paid was honest</td>
<td>0.843</td>
<td>Accepted</td>
</tr>
</tbody>
</table>
Structural Equation Modeling
Table 6 presents the Partial Least Square (PLS) estimates of impact of service quality and price fairness on consumer loyalty: moderating the role of information literacy. The dependent variable used in a model is consumer loyalty (CONL), and independent variables are service quality (SQL), price fairness (PRF), while moderator variable is information literacy (INFL). The outcomes explores that the variables service quality, price fairness, and information literacy positively and significantly related to the consumer loyalty. The value of $R^2$ is found to be 0.776, it explores that the variation in dependent variable (consumer loyalty) due to independent variables is 77.6 percent while lasting 22.4 percent is due to the other factors that are not added in a model.

| Source: Author’s Calculations |

Table 6: PLS Estimates of Impact of Service Quality & Price Fairness on Consumer Loyalty

<table>
<thead>
<tr>
<th>Variables</th>
<th>Original Sample Mean</th>
<th>Standard Deviation</th>
<th>T Statistics</th>
<th>P-Values</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>SQL -&gt; CONL</td>
<td>0.312</td>
<td>0.101</td>
<td>3.099</td>
<td>0.002</td>
<td>Supported</td>
</tr>
<tr>
<td>PRF -&gt; CONL</td>
<td>0.106</td>
<td>0.058</td>
<td>1.828</td>
<td>0.068</td>
<td>Partially supported</td>
</tr>
<tr>
<td>INFL -&gt; CONL</td>
<td>0.508</td>
<td>0.112</td>
<td>4.548</td>
<td>0.000</td>
<td>Supported</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.776</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$R^2$ Adjusted</td>
<td></td>
<td></td>
<td></td>
<td>0.772</td>
<td></td>
</tr>
</tbody>
</table>

Source: Author’s Calculations

Moderation Analysis
Table 7 presents the PLS estimates of impact of service quality and price fairness on consumer loyalty: moderating the role of information literacy. The interaction term of service quality and information literacy (SQL*INF), price fairness and information literacy (PRF*INF) is added into the model. The outcomes of the moderated regression show that information literacy positively moderates the relationship between service quality and consumer loyalty as the association is found to be statistically significant (Coefficient= 0.269, Prob.= 0.000). The fourth hypothesis of the study “information literacy moderates the relationship between service quality and consumer loyalty” is accepted. On the contrary the variable information literacy negatively
moderates the relationship between price fairness and consumer loyalty as the association is found to be statistically significant (Coefficient= -0.121, Prob. = 0.002). The fifth hypothesis of the study “information literacy moderates the relationship between price fairness and consumer loyalty” is accepted. The value of R² is found to be 0.805, it explores that the variation in dependent variable (consumer loyalty) due to independent variables is 80.5 percent while lasting 19.5 percent is due to the other factors that are not added in a model. The change in R² is found to be 0.029, it shows small size effect.

Table 7: Moderation Analysis

<table>
<thead>
<tr>
<th></th>
<th>Original Sample Mean</th>
<th>Standard Deviation</th>
<th>T-Statistics</th>
<th>P-Values</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>SQL*INFL -&gt; CONL</td>
<td>0.269</td>
<td>0.052</td>
<td>5.150</td>
<td>0.000</td>
<td>Supported</td>
</tr>
<tr>
<td>PRF*INFL -&gt; CONL</td>
<td>-0.121</td>
<td>0.041</td>
<td>2.975</td>
<td>0.003</td>
<td>Supported</td>
</tr>
<tr>
<td>R²</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.805</td>
</tr>
<tr>
<td>ΔR²</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.029</td>
</tr>
</tbody>
</table>

Source: Author’s Calculations

An alternative way to observe the moderation analysis by simply look at the sloop analysis that visualize two-way interaction effect. Figure 2 shows the simple slope analysis to test the moderation association. The three lines in the figure show the relationship between service quality and information literacy. The middle lines in the figure shows the moderator variable information literacy. Figure shows that higher information literacy stronger the relationship between service quality and consumer loyalty while lower information literacy weaker the relationship between service quality and consumer loyalty. This relationship is found to be positive.

![Figure 2: Slope Plot Analysis](image)

Source: Author’s Calculations

Figure 3 shows the simple slope analysis to test the moderation association. The three lines in the figure shows the relationship between price fairness and information literacy. The middle line in the figure shows the moderator variable information literacy. Figure shows that higher information literacy lead to weaker the relationship between price fairness and consumer loyalty while lower information literacy lead to stronger the relationship between price fairness and consumer loyalty. This relationship is found to be negative.
Hypothesis-wise Discussion

H₁: The impact of service quality on consumer loyalty is positive
It is found that service quality is positively and significantly ($t$-stat=3.099, $Prob.$=0.002) associated to the consumer loyalty so that the first hypothesis of the study “there is positive relationship between service quality and consumer loyalty” is accepted. Good service quality would represent a good reputation for the company. Services are an evolving process of ongoing customer-service encounters consisting of a range of intangible activities that are offered as premium solutions to customer issues, including physical and financial tools and all other valuable framework elements involved in the provision of these services (Gronroos, 2004). So that consumers become more loyal to the companies that provide good service quality. These outcomes are also verified in the studies of Fida et al. (2020); Safi & Awan (2018); Kumar (2017); Poku et al. (2013).

H₂: The impact of price fairness on consumer loyalty is positive
The variable price fairness is also found to be positively ($t$-stat = 1.828, $Prob.$ = 0.068) associated to the consumer loyalty. The second hypothesis of the study “there is positive relationship between price fairness and consumer loyalty” is accepted. If consumers perceived that the price charge by companies is fair so they become more loyal to the products of the companies. These outcomes are also found in the studies of Susanti (2019); Nazari et al. (2014); Yaqub et al. (2019).

H₃: The impact of information literacy on consumer loyalty is positive
The variable information literacy is also found to be positively and significantly ($t$-stat= 4.548, $Prob.$ = 0.000) associated to the consumer loyalty. The third hypothesis of the study “there is positive relationship between information literacy and consumer loyalty” is accepted. If consumers have full information regarding the product quality in comparison to the other companies they may choose high quality product companies so that consumers become more loyal with companies having more information literacy about that company.

H₄: Information literacy moderates the relationship between service quality and consumer loyalty
The moderator variable information literacy positively moderates the relationship between service quality and consumer loyalty as the association is found to be statistically significant ($Coefficient$= 0.269, $Prob.$ = 0.000). The fourth hypothesis of the study “information literacy moderates the relationship between service quality and consumer loyalty” is accepted.
H5: Information literacy moderates the relationship between price fairness and consumer loyalty

The moderator variable information literacy negatively moderates the relationship between price fairness and consumer loyalty as the association is found to be statistically significant (Coefficient= -0.121, Prob.= 0.002). The fifth hypothesis of the study “information literacy moderates the relationship between price fairness and consumer loyalty” is accepted.

**Table 8: Research Hypothesis**

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Description of Hypothesis</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1</td>
<td>The impact of service quality on consumer loyalty is positive</td>
<td>Accepted</td>
</tr>
<tr>
<td>H2</td>
<td>The impact of information literacy on consumer loyalty is positive</td>
<td>Accepted</td>
</tr>
<tr>
<td>H3</td>
<td>The impact of price fairness on consumer loyalty is positive</td>
<td>Accepted</td>
</tr>
<tr>
<td>H4</td>
<td>Information literacy moderates the relationship between service quality and consumer loyalty</td>
<td>Accepted</td>
</tr>
<tr>
<td>H5</td>
<td>Information literacy moderates the relationship between price fairness and consumer loyalty</td>
<td>Accepted</td>
</tr>
</tbody>
</table>

**Conclusion**

This study attempts to analyze the impact of service quality and price fairness on consumer loyalty by moderating the role of information literacy. All operational top category food and beverage hotels existing in the hotel industry of Multan city were included as the population in the study. The data of 200 customers of hotels in Multan city were collected by using a convenient sampling technique. Partial least square (PLS) is used to estimate the results. Confirmatory analysis found that all the measures use to check the reliability and validity of data has fulfilled the threshold, it is concluded that the data used in a study is highly reliable. Correlation analysis shows that consumer loyalty is positively correlated with service quality, information literacy, and price fairness. PLS estimates explore that the variables service quality, price fairness, and information literacy are positively and significantly related to consumer loyalty. The outcomes of the moderated regression show that information literacy positively moderates the relationship between service quality and consumer loyalty as the association is found to be statistically significant. On the contrary, the variable information literacy negatively moderates the relationship between price fairness and consumer loyalty as the association is found to be statistically significant. All hypotheses of the study are accepted from the analysis and found that price fairness and service quality positively affect consumer loyalty in Pakistan. Therefore, managers of the hotel should focus on service quality and price fairness. Just price may increase the sales and loyalty of customers.

**Managerial Implications**

The outcomes of the study have added to the body of knowledge on customer loyalty by emphasizing the importance of service quality and price fairness as the primary predictors of customer loyalty in the Pakistani hotel industry. Information literacy was also found to be a major mediator between service quality and consumer loyalty, as well as price fairness and consumer loyalty, in the study.
This research has a number of managerial implications. The study's findings will give solid foundations for practitioners, particularly hotel managers in Pakistan, to develop and implement loyalty initiatives. Despite this, the most important indicator of customer loyalty is service quality. Similarly, research found that price fairness has a significant impact on consumer loyalty. Given the foregoing facts, hotel management must take efforts to improve service quality in order to promote customer loyalty. They will be able to capture the biggest proportion of the market in this way. The study's findings assist the hotel sector in focusing more on research progress in order to improve service quality and customer loyalty by viewing it as a hotel management goal.

**Limitations of the Study**

Despite the significant contribution of the study addressed in earlier section, there are some limitations of the current study. This data used in a study was only limited to customers of top-class outlets with a sample size of 200 respondents in Multan city. Further studies can also expand the sample size and can use the data from other cities of Punjab. On the contrary consumer loyalty affected by many other factors further studies can also be conducted and may use predictors and mediator variables such as satisfaction, trust, and revisit intonation etc.

**Recommendations**

To improve the service quality and boost the hotel industry in Pakistan following suggestions are recommended:

1. Managers of hotels must invest and improve the quality of service. Frequent surveys can also be conducted to assess the perceptions and suggestions of customers to improve service quality.
2. From the bottom to the top of their organization, managers must keep control of all actions linked to the idea of quality. Furthermore, leaders must treat their consumers with admiration and complete consideration to comprehend their expectations and experiences and to prevent conflict between them, which may improve customer loyalty.
3. Managers must enhance employee understanding of the idea of service quality since employees are responsible for dealing with customers and have direct contact with them.
4. Advertisement strategies may also be used to increase the sale of hotels. As information literacy is found to be the positive factor of consumer loyalty so that information about the products and services of hotels can also increase the loyalty of customers.

It is critical to innovate services in response to the requirements and wants of customers. Every approach must be centered on the customer. Hotel management must consider the ultimate consequence of their service quality improvements in this respect. Rather than focusing on the immediate issue, the attention should be on the long term.

**References**


Corporate Tax, Operating Cash flow and Sales Growth and their Impact on Dividend Payout Ratio in Oil and Gas Companies Listed in Karachi Stock Exchange (KSE)

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**ARTICLE DETAILS**
**ABSTRACT**

**History**
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**Keywords**
Corporate Tax, Operating Cash flow, Sales Growth, Dividend Payout Ratio.

**JEL Classification**
M40, M41

**Purpose:** The purpose of this study is to comprehend the dynamics of dividend payout in Pakistan’s oil and gas sector. This study is an attempt to differentiate what are factors force firms to distribute dividends instead of enhancing retained earnings. To draw the required results 13 listed oil and gas companies have been incorporated in this study and their 5 years’ data has been studied.

**Design/Methodology/Approach:** This study is quantitative and secondary data has been used to extract results. The sources of the data are financial statements of the companies under study. Fixed and random effects of regression were used for data analysis.

**Findings:** Based on this study, it can be concluded that the independent variables selected in this model have the power to explain the dependent variable by 45%, which means the results generated through this study can be given importance accordingly in the oil and gas sector of Pakistan. The explanatory variables were identified from the prior literature and then their impact on dividend payout ratio was studied.

**Implications/Originality/Value:** It is evident from the results of the study that management can take necessary steps to formulate a mutually beneficial dividend policy that can enhance the strength and effectiveness of these explanatory variables to enforce a dividend policy that fulfils the expectations of both the investors and the company. The investors can also evaluate different factors that might have an impact on dividend distribution and they can also get the ability to determine dividend payout ratio which made the basis for decision making for investment in the given sector.

Introduction
In different organizations, dividend payout has been a subject of significance among corporate finance. Many studies have been presented by different academicians to define theoretical models which can identify different factors that should be considered by managers or decisions makers while establishing dividend payout policy. In the study of Imran (2011), AlTaleb (2012) and Lestari (2018) found that to pay a dividend, cash-flow applies a substantial negative influence on the firm propensity. Dividend payout policy addresses what proportion of earnings should be distributed among shareholders in the form of dividends, i.e., it calculates dividend payout ratio.

In this study our focus is on studying the impact of corporate tax, operating cash flow and sales growth on dividend payout ratio and to establish whether the relationship is significant or not. It stated that different researchers derive that there is a positive insignificant relationship between a firm’s cash flow and a firm’s dividend payout decision (Azouzi & Echchabi, 2016; Suhaiza & Yusniliyana, 2016; Najjar & Kilincarslan, 2018).

The authors said that both of firm’s cash-flow and dividend payout to the stockholders are directly and significantly related to each other (Musa, 2009; Wasike & Ambrose, 2015; Nishant & Ramesh, 2015; Rihanat et al., 2016). In Pakistan, the Oil and gas sector is seen as the most lucrative sector by stock investors. The Oil and gas sector is also recognized as a growth engine by the economists and government of Pakistan.

Background of the Study
The matter of dividend policy comes under the vast umbrella of financing decisions because the profits earned by corporations can be a source of financing in the form of retained earnings. Retained earnings on the other hand either affect or are affected by the dividend payout policy. The issue of dividend payout policy is placed within the basket of highly critical financial decisions. The deep we dig to attain a full understanding of dividend payout, the farther it becomes – like pieces of the puzzle that are very hard to fit together (Black, 1976). Brealy and Myers (2003) concluded that even after decades of exploration, the matter of dividend payout policy ranks higher among the list of unresolved financial issues.

The comprehension of the dividend payout ratio is vital for every concerned party, especially investors as it highlights signals to predict a corporation’s dividend sustainability and its potential to grow (Linter & John, 1956). Therefore, it becomes extremely important to define the factors that influence a corporation’s dividend payout ratio.

In 1991 International Finance Corporation ranked Pakistan’s equity market among the top twenty rising equity markets. Though in the late 1990s equity market in Pakistan faced a declining trend again it re-emerged. The International Magazine Business Week regarded Pakistan’s equity market as an emerging market with the best performance in comparison to other developing markets from 2002 to 2004.
It has been noticed that there is a general assumption that the dividend payout ratio is not affected by different sectors of an economy. Amidu and Abor (2006) concluded that there is no significant relationship between sectors of an economy and dividend payout ratio, whereas, Allen, Bernardo and Welch (2000) found a significant influence of sectors on dividend payout ratio. This study investigated the influence of the selected factors on the dividend payout ratio in the Oil and Gas sector of Pakistan.

**Gap Identification**

There might be some research done on dividend payout ratio in Pakistan but specifically, in the Oil and Gas sector such research work could not be found (Mahira, R 2012). As we know the Oil and Gas sector is one of the top preferred sectors in the eyes of stock investors, therefore it is necessary to understand the factors that affect or might affect dividend disbursement. We have also noticed through literature that the findings of studies carried out on this subject have contradictory outcomes; hence it becomes unavoidable to execute such research for every sector individually.

**Problem Statement**

There are different theories regarding the effect of economic sectors on dividend payout ratio and fit has also been noted that in Pakistan generally it is assumed that future earnings are the only indicators of dividend ratio. Dividend payout in emerging markets is more complex as compared to developed markets. In the presence of these alternative theories, managers need to know that in emerging markets, like Pakistan what is the impact of factors understudy on dividend payout ratio in the sector of oil & gas in Pakistan.

**Objectives of the Research**

The objectives of the study are;

1. To determine the relationship between corporate tax on dividend payout ratio in Pakistani listed companies of oil & gas sector.
2. To examine whether operating cash flow has any relationship with dividend payout ratio in Pakistani listed companies of oil & gas sector.
3. To examine the relationship of sales growth on dividend payout ratio in Pakistani listed companies of oil & gas sector.

**Significance of the Study**

Strategic corporate financial management is critical for any firm whether it’s public or private limited because the purpose of the existence of the firms is the maximization of returns on invested funds for investors. Similarly, investors tend to look for an opportunity where they can gain more dividends on a stock. The distribution of dividends is important for the retention of investors as well as for attracting new investors. But this is not as simple as stated because firms’ also need capital for future opportunities therefore, they need to retain reasonable earnings for that purpose. Considering such a complex situation were creating a balance between two contrary factors is critical for the success of an individual firm, this study will give the management and the investors an inside look at what factors need to be taken care of while predicting or deciding the distribution of dividends.

**Research Questions**

This study is an attempt to empirically answer the following questions about oil and gas sector companies listed in Karachi Stock Exchange of Pakistan;

- Does corporate tax affect dividend payout ratio and what is the level of significance?
- Does operating cash flow affect dividend payout ratio and what is the level of significance?
- Does sales growth affect dividend payout ratio and what is the level of significance?
Literature Review

Linter (1956) can be regarded as one of the first researchers to carry out a study on the subject of determinants of dividend policy. The study concluded that the disbursement of dividends is dependent upon the current year’s earnings and the dividends paid last year. Franco Modigliani and Merton Miller (1961) suggested that in a perfect capital market there is no relevance between dividend policy and a firm’s value. Furthermore, the study also suggested that the value of the corporation is not affected by high or low dividend payout. Before the irrelevance theory was presented it was generally assumed that dividend payout is strongly correlated to a stock’s value (Kent Baker, 2009).

In contrast to Dividend irrelevance theory, the bird in hand theory suggests that the value of the company is affected by the dividend payments. Gordon (1963) presented this theory and since then many researchers have supported this theory. Many studies oppose this theory. As per them, this theory has discarded many important factors. By increasing current dividends, the risk associated with the company does not decrease (Keown, 2007).

Dividend payments or dividend payout can be viewed as a signal to a firm’s expected future cash flows (Bhattacharya, 1979). The agency theory is regarded as one of the fundamental dividend theories. Agency cost can be defined as the cost incurred between stockholders known as principal and the management referred to as the agents (Jensen & Meckling, 1976). Rozeff (1982) formulated an optimal dividend model. By paying dividends to the investors the agency cost can be reduced. Baker and Wurgler (2004) presented the catering theory, which emphasizes the management to distribute dividends as per the preferences of the investors.

Edelman (1985) reports that managers of organizations believe that dividend payout stability is desirable. If this position is accurate, investors should prefer stocks that pay more predictable dividends to those that pay the same amount of dividends in the long run but in a more erratic manner. The dividends are higher because dividends face double taxation whereas capital gain does not face double taxation (Kent baker, 2009).

Dividend Payout Vs Dividend Yield Ratio

The dividend payout ratio is not dependent upon the external factor. It only incorporates firms’ internal factors for the measurement of dividend distribution (Penman, 2009). This is evident from the definition of dividend payout ratio, as it is calculated by measuring the percentage of the firms’ earnings distributed among the shareholders. The dividend yield is affected by external factors as it incorporates stock price while measuring dividends (Warren et. al, 2011). The dividend yield is calculated by dividing the dividend paid to the shareholders by the stock price of that firm.

Prior literature suggests that both measures of dividend are different therefore it is critical to opt for the most relevant measure as it can substantially affect the findings of the study. The dividend payout ratio is more significant as compared to dividend yield as it elaborates on returns on the earning of a company (McManus et al. 2004). McManus (2004) further iterates that the dividend payout ratio has more strength as compared to dividend yield when it comes to generating signals for investors and the dividend yield is less informative with comparison to the dividend payout ratio. The dividend yield is open to external factors that are beyond the control of the firms’ management; with change in stock price dividend yield also changes, hence proving that the management cannot control dividend yield (Steven & Jose, 1992).

Contrary to that Fama & French (1998), concluded that as dividend yield can be used to predict the return on the stock, therefore, dividend yield with comparison to dividend payout ratio is more significant. Since there are two different opinions regarding the selection of a measure of
dividend distribution, in this study dividend payout ratio has been opted as the measure of dividend distribution because the purpose of this study is to provide helpful information to the management of Oil and Gas firms of Pakistan as they can utilize the findings of this study to better design their dividend policy.

**Operating Cash Flow per Share**

The literature exhibits that cash flow generated through operations has a positive impact on the dividend payout ratio. Cash flow generated from operations serves as a most significant determinant and further, it can be concluded that high liquidity position firms tend to distribute more dividends when compared with the firms with comparatively low liquidity positions (Anil and Kapoor, 2008). In the study of Imran (2011), AlTaleb (2012) and Lestari (2018) found that to pay dividends, cash-flow applies a substantial negative influence on the firm propensity.

According to Rihanna et al. in (2016), Wasike and Ambrose (2015), Nishant and Ramesh (2015) and Musa states in (2009) that both of firm’s cash-flow and dividend payout to the stockholders are directly and significantly related to each other whereas Al-Najjar and Kilincarslan in (2018), Azouzi and Echchabi in (2016) and Suhaiza and Yusniliyana in (2016) derives a positive insignificant relationship between firm’s cash-flow and firm’s dividend payout decision. The profitability and size of the firm increase cash flow. Similarly, Soodur et al. in (2016) and Demirgüneş (2015) found insignificant relation between firm’s cash-flow and firm’s dividend payout decision. The profitability and size of the firm increase cash flow. Similarly, Soodur et al. in (2016) and Demirgüneş (2015) found insignificant relation between firm’s cash-flow and firm’s dividend payout decision. The profitability and size of the firm increase cash flow.

**Corporate Tax**

The dividend payments can serve as a tax shield; hence the negative impact of tax can be avoided (Miller and Scholes, 1978). Imposing a tax on dividend payments does not significantly affect the dividend ratio (Omet, 2004). Omet (2004) come with the same results in the situation of fa firms registered with the Aman securities market and more on the tax imposed on dividends cannot give significant impact on dividends payout behaviour in the registered firm. Reddy (2006) said that in India, those firms paying dividends are most profitable, in large size, and grow fast. An explanatory variable, corporate tax taken as negative association with dividend payout in the organization by Anil and Kapoor (2008). In Reddy’s (2006) conclusion, the study of the information technology sector in India found it to be consistent and insignificant. In the Indian context, the theory related to tax preference and corporate tax does not appear to hold. In Pakistan, it is very interested to note the effect of corporate tax.

**Sales Growth**

The signalling theory formulated by Bhattacharya (1980) suggests that the firms with high growth are willing to pay high dividends. The growth of a firm serves as an important signal for investors; hence it predicts investing opportunities for investors. Investment opportunity serves as a factor determining dividend payout ratio and sales growth can be used as a proxy to empirically measure its effect on dividend payout ratio (D’Souza, 1999). In the case of growth, it represents an insignificant as well as a positive relationship. In another study explained by Higgins (1981), there is a direct link between a firm’s growth and the financing needs of the organization. Similarly, the growth rate of sales measures the growth rate of the organization (Lloyd et al., 1985; Rozeff, 1982; Moh’d et al., 1995; Holder et al., 1998; Chen et al., 1999). Hence, the growth rate of the organization is identified in this research by an annual sales growth.

Some studies have incorporated the growth opportunity to measure the growth of a firm (Rozeff, 1982), whereas other studies have incorporated the actual growth rate in terms of the difference
of sales in current years concerning previous years.

**Proposed Hypotheses**
H1: Cash flow generated through operations has a positive significant relationship with dividend payout ratio.
H2: Corporate tax and dividend payout ratio exhibit a negative significant relationship.
H3: Positive and significant relationship can be found between sales growth and dividend payout ratio.

**Research Methodology**
To answer the research question, there are three basic types of studies, i.e., exploratory study, descriptive study and explanatory study (Saunders et. al, 2009). This study is quantitative and secondary data has been used to extract results. The sources of the data are financial statements of the companies under study. As per the literature review discussed earlier, the following variables have been studied in this study. Dividend payout ratio (dependent variable), Corporate tax, Sales Growth and Operating Cash flow (Independent variables). The variables used in the study are mentioned in the given table-1. Dividend payout Ratio (DPR), Operating Cash Flow per share (CFO), Corporate Tax (CT), and Sales Growth (SG). The DPR is taken as effect variables while others as casual.

<table>
<thead>
<tr>
<th>Variable Name</th>
<th>Type of Variable</th>
<th>Symbol</th>
<th>Description</th>
<th>Expected Sign</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dividend payout Ratio</td>
<td>Dependent</td>
<td>DPR</td>
<td>Dividend/Earnings</td>
<td></td>
</tr>
<tr>
<td>Operating Cash Flow per share</td>
<td>Independent</td>
<td>CFO</td>
<td>Operating Cash Flow / Total No. of Shares outstanding</td>
<td>+</td>
</tr>
<tr>
<td>Corporate Tax</td>
<td>Independent</td>
<td>CT</td>
<td>Corporate tax/Net profit before tax</td>
<td>-</td>
</tr>
<tr>
<td>Sales Growth</td>
<td>Independent</td>
<td>SG</td>
<td>(Current sales - Previous sales)/Previous sales</td>
<td>+</td>
</tr>
</tbody>
</table>

The population for this study will be all Oil and Gas Sector firms listed on Karachi Stock Exchange (KSE) Pakistan. There are 13 Oil and Gas companies listed on KSE. The study sample was comprised of 13 companies given in table-2.

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Name of the Listed Company</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATRL</td>
<td>Attock Refinery Ltd</td>
</tr>
<tr>
<td>APL</td>
<td>Attock Petroleum Ltd</td>
</tr>
<tr>
<td>BYCO</td>
<td>Byco Petroleum Pakistan Ltd</td>
</tr>
<tr>
<td>BPL</td>
<td>Burshane LPG (Pakistan) Ltd</td>
</tr>
<tr>
<td>MARI</td>
<td>Mari Petroleum Ltd</td>
</tr>
<tr>
<td>HASCOL</td>
<td>Hascol Petroleum Company Ltd</td>
</tr>
<tr>
<td>NRL</td>
<td>National Refinery Ltd</td>
</tr>
</tbody>
</table>
OGDCL  Oil and Gas Development Company Ltd
SHEL  Shell Pakistan Ltd
PRL  Pakistan Refinery Ltd
PPL  Pakistan Petroleum Ltd
POL  Pakistan Oilfields Ltd
PSO  Pakistan State Oil Company Ltd

**Research Analysis**

Descriptive statistics establish whether the distribution of the data is normal or not. In this study for each variable under study, there are 64 observations for 13 listed companies for 5 years. Therefore, for all four variables, the total number of observations for five years and 13 companies is 320.

Descriptive statistics prove the normality of the data in this study as it shows that the mean for all the variables is close to their respective median. Corporate tax has the maximum mean, whereas Operating Cash flow has the lowest. The difference between maximum and minimum values for all variables is reasonable, the being that of corporate tax. The corporate tax also displayed a higher standard deviation of 0.6983, on the other hand, sales growth has the lowest standard deviation of 0.3625. All the variables except operating cash flow have positive skewness, which implies that operating cash flow is negatively skewed from the data average. The test also shows that at a confidence interval of 95 per cent, the variables under study are significant, as their respective probability value is less than five percent.

<table>
<thead>
<tr>
<th>Dividend Payout Ratio</th>
<th>Corporate Tax</th>
<th>Operating Cash Flow</th>
<th>Sales Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>DPR</td>
<td>CT</td>
<td>OCF</td>
<td>SG</td>
</tr>
<tr>
<td>Mean</td>
<td>0.3765</td>
<td>0.3953</td>
<td>0.1209</td>
</tr>
<tr>
<td>Median</td>
<td>0.2215</td>
<td>0.3309</td>
<td>0.2589</td>
</tr>
<tr>
<td>Maximum</td>
<td>3.1100</td>
<td>4.4828</td>
<td>0.9839</td>
</tr>
<tr>
<td>Minimum</td>
<td>-0.3102</td>
<td>-0.8944</td>
<td>-1.9675</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>0.4905</td>
<td>0.6983</td>
<td>0.5465</td>
</tr>
<tr>
<td>Probability</td>
<td>0.00000</td>
<td>0.00000</td>
<td>0.00000</td>
</tr>
<tr>
<td>Observations</td>
<td>64</td>
<td>64</td>
<td>64</td>
</tr>
</tbody>
</table>

**Correlation Matrix**

The correlation matrix table 4 shows that the dividend payout ratio is negatively correlated with all three independent variables. The magnitude of this correlation is minimal. The table also shows that a positive correlation exists between operating cash flow and corporate tax. The magnitude of the correlation between corporate tax and operating cash flow is .1634. The highest correlation exists between sales growth and corporate tax i.e., -0.2029. The lowest correlation between dividend payout ratio and operating cash flow.

<table>
<thead>
<tr>
<th>Correlation Matrix</th>
</tr>
</thead>
<tbody>
<tr>
<td>DPR</td>
</tr>
<tr>
<td>DPR</td>
</tr>
<tr>
<td>CT</td>
</tr>
<tr>
<td>OCF</td>
</tr>
<tr>
<td>SG</td>
</tr>
</tbody>
</table>

891
Tests to Check Conditions of Regression
To verify that the data set in our study fulfils the conditions of regression or not; two tests have been executed. These tests clarified whether the assumptions of regression have been violated or not. These three tests are; autocorrelation and multicollinearity and regression with fixed effect.

The autocorrelation assumption of regression states that the distribution of residuals should not have a set pattern, i.e., the spread between errors must be random. If the covariance is found between residuals, the data is referred to have autocorrelation between residuals and in such a case the assumption of regression is violated. In statistics, this measure i.e., autocorrelation determines that the variables under study are independent of each other or they have some correlation present. If the data under study is found to be autocorrelated or some of the pairs of variables are found to be autocorrelated with each other then it is assumed that the data or the selection of variables has some mistake. Usually, in such a case one of the variables is excluded from the model. In our study, no pair of the variable was found to be significantly autocorrelated. To check for autocorrelation different tests can be executed but we have executed the Durbin Watson Stat test to verify this assumption of regression.

The data under study is said to be multilinear if a significant linear relationship is observed between two or more variables. If such a relationship is found between two or more variables, then the results can be perceived as biased which on the other hand guides towards biased hypothesis testing. Multicollinearity can be tested by correlation matrix that already has been discussed above and that proved that there is no significant linear relationship among the variables under study. The magnitude of the correlation as shown in the correlation matrix is not substantial, hence it would not have a major impact on the results.

As it has been proved that none of the assumptions of regression has been violated, therefore regression can be used as an effective tool to establish a relationship between independent variables and dependent variables in this study. By proving that assumptions of regression are met, this study also has discarded any possible doubt or question over the hypothesis to be unbiased. Three different regression analyses have been carried out, one with fixed effect, the second with random effect and another one without applying the fixed or random effect. The result of all three regression analyses is quite different from each other. Each regression analysis and its result are described briefly.

The fixed effect is used on panel data when the impact of factors that tend to vary in a given period is analyzed. Fixed effect determines the relationship between independent variables and dependent variable(s) concerning an entity like a company, person geography etc. The entity understudy may or may not have an impact upon the explanatory power of the independent variable. For example, the demographic attributes of individuals (entity) may or may not affect the opinion about some particular issue. When the fixed effect is used it is assumed that attribute(s) of the entity under study (Oil and Gas companies in our study) may impact independent or dependent variables and such an impact needs to be controlled.

In this study when the fixed effect is applied to the regression analysis it reveals the negative relationship between corporate tax and dividend payout ratio, a positive relationship between
operating cash flow and dividend payout ratio and a positive relationship between sales growth and dividend payout ratio. The probability for all three independent variables is within the 5 per cent level of confidence which enforces the effectiveness of this model.

The table below represents that with every one unit increase in corporate tax, the dividend payout ratio decreased by 0.2 units. Similarly, the regression table below also enforces that there is an increase of 1.24 units in dividend payout ratio with a 1 unit increase in operating cash flow. The sales growth also increases the dividend payout ratio by 1.023 units with one its 1-unit increase.

Corporate tax represents a standard error of 9 percent, whereas, operating cash flow and sales growth represent a standard error of 52.31 percent and 21.91 percent respectively.

The value of R square is 4per cent which means that the explanatory power of these independent variables in determining dividend payout ratio is not so weak. Though there is room for adding more variables to strengthen the model, the impact of these three independent variables in determining the dividend payout ratio is strong.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>0.4405</td>
<td>0.0779</td>
<td>5.6567</td>
<td>0.0000</td>
</tr>
<tr>
<td>CT</td>
<td>-0.20</td>
<td>0.09</td>
<td>-2.22</td>
<td>0.048*</td>
</tr>
<tr>
<td>OCF</td>
<td>1.2413</td>
<td>0.5231</td>
<td>-2.3729</td>
<td>0.031*</td>
</tr>
<tr>
<td>SG</td>
<td>1.0213</td>
<td>0.2191</td>
<td>4.6613</td>
<td>0.0212*</td>
</tr>
</tbody>
</table>

R-squared 0.452664
Prob(F-statistic) 0.005417

*Indicates less or equal to 5 percent significance.

Regression Analysis on Random Effect
In Random analysis unlike fixed effect assumption, it is assumed that the variation in the entities is random and these variations are not correlated with the independent variable(s). The coefficients shown in the regression table depict the magnitude of change independent variable with each unit change in the independent variable. When regression is run by keeping cross-section as random, a negative relationship between independent variables and dependent variables was noted. From the below table it is obvious that corporate tax has the highest coefficient which iterates that as compared to other factors under study, corporate tax tends to have more impact on the dividend payout ratio. The probability in this model for corporate tax is within the limit of 5 per cent whereas in the case of operating cash flow and sales growth it is beyond the limit of 5 percent.

Regression on a random effect basis suggests that an increase in 1-unit corporate tax would result in a decrease of dividend payout ratio by 0.13 units. The standard error for corporate tax is 5.21 percent. On the other hand, for sales growth and operating cash flow, the random effect regression model suggests that the impact on dividend payout ratio is not significant as it is below 95 percent confidence level. The value of R square and adjusted R square is approximately 4 percent and 0.1 percent respectively which states that the explanatory power of this model in determining dividend payout ratio is very weak.
Table 6
Regression Analysis – Random Effect

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>0.4326</td>
<td>0.1140</td>
<td>3.7961</td>
<td>0.0003</td>
</tr>
<tr>
<td>CT</td>
<td>-0.1392</td>
<td>0.0521</td>
<td>-2.6717</td>
<td>0.0012*</td>
</tr>
<tr>
<td>SG</td>
<td>-0.0085</td>
<td>0.1604</td>
<td>-0.0532</td>
<td>0.9578</td>
</tr>
<tr>
<td>OCF</td>
<td>-0.0191</td>
<td>0.1047</td>
<td>-0.1823</td>
<td>0.8560</td>
</tr>
</tbody>
</table>

Weighted Statistics

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>R-squared</td>
<td>0.0397</td>
</tr>
<tr>
<td>Prob(F-statistic)</td>
<td>0.4839</td>
</tr>
</tbody>
</table>

*Indicates less or equal to 5 percent significance.

The Hausman Test
If the correlation is found between independent variables and error terms it means the ordinary least square estimator has failed. In case this estimator fails we can use an instrumental variable estimator. The Hausman test is used to identify the correlation between independent variables and error terms. In a model where fixed effect regression estimation is supposed to be appropriate, the Hausman test identifies that in such case random effect regression estimation will be as good as fixed effect regression estimation or not. In summary, it can be concluded that the Hausman test can be used to identify that fixed effect regression should be used or random effect should be used.

In the case of fixed-effect regression estimation this test tests Ho: which states that the random effect regression estimation will be more effective, versus H1: which states that the random effect regression estimation will be inconsistent.

In our study, the value of the Hausman test is greater than 0.07 which represents that the fix effect regression estimation is better than the random effect regression estimation. The results of fixed-effect regression also show more effective results as compared to the random effect regression.

Conclusion
This study is an attempt to comprehend the dynamics of defining different factors to determine the dividend payout ratio concerning oil and gas companies listed in the Karachi Stock Exchange index. The purpose of the study was to provide relevant parties with empirical results as to which are the most common variables that help in the determination of dividend payout ratio. Based on this study, it can be concluded that the independent variables selected in this model have the power to explain the dependent variable by 45 per cent, which means the results generated through this study can be given importance accordingly in Oil and Gas sector of Pakistan. The explanatory variables were identified from the prior literature and then their impact on dividend payout ratio was studied. These explanatory variables are Corporate Tax, Cash Flow from Operations and Sales Growth. There are 13 oil and gas companies listed on Karachi Stock Exchange and all these companies were selected to draw more significant results. The data was gathered from financial statements of the firms and was arranged as panel and pool data as a series of time was an understudy and the tool of regression was used to conclude the desired results. Fixed effect regression estimation and random effect regression estimation was used to determine the relationship between explanatory variables and dependent variable.

The fixed effect regression estimation exhibited more meaningful results as was proved by the Hausman test. In our study, the value of the Hausman test is greater than 0.07 which represents that the fix effect regression estimation is better than the random effect regression estimation.
The results of fixed-effect regression also show more effective results as compared to the random effect regression. The descriptive statistics proved the data to be normally distributed.

The regression results revealed that all three explanatory variables have a significant impact on the dividend payout ratio. It was also found that the model that we used in our study shows that it has good explanatory power. The test revealed that this model can predict 45 per cent of fluctuation in dividend disbursement. The significance of cash flow from operations found in this study is consistent with the findings of Alli and Ramirez (1993). The corporate tax as revealed in this study has also a significant impact on the dividend payout ratio in the oil and gas sector of Pakistan, this result is consistent with the findings of Omet (2004).

Area for Further Research
The results of this study have un-curtained various questions which must be explored in future studies. The scope of this study is limited as in this study only three company selected factors were studied to find their relationship with dividend payout ratio, therefore there is a scope for academicians to include other various factors to extract more meaningful results. It is evident from the results of the study that the ability of selected factors as a unit to determine the dividend payout ratio is good but still, there is a need of adding more company selected variables, therefore there is vast room for future research.

References
Daniel (2007), ‘Do Firms Manage Earnings To Meet The Dividend Threshold?’


Factors of Customer Satisfaction in the Servicing Sector: Does Quality of Service Matter?

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ARTICLE DETAILS

ABSTRACT

Purpose: The purpose of the study is to evaluate the influence of the cost of financing, customer loyalty, and customer security on customer satisfaction with financial services as moderating effects in the Pakistani context. This study aims to provide the financial services concept between the cost of customer loyalty, customer security, financing and customer satisfaction.

Methodology: Data is gathered through the use of a questionnaire. A total of 330 respondents from Pakistan's five largest banks participated in the study. The information gathered pertains to the various roles that bank personnel play on behalf of bank clients. The sample approach utilised in this study is a convenience sampling method. The SPSS program is used to evaluate the data on the demographics of the area. The PLS-SEM is used to investigate the conceptual model.

Findings: To achieve banking goals in the long term, financial service quality has a favorable effect on customer loyalty and satisfaction, as well as on the cost of financing. Even in the conventional banking sector, the quality of financial services is not adhered to. Financing prices, customer loyalty, customer security, and customer satisfaction all have a direct correlation to the quality of financial services.

Practical Implications: To generate high profits and productivity, financial organizations must develop the quality mechanisms to get the best results from customer satisfaction goals.

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Introduction

Customer satisfaction is a major concern for all banks nowadays. In both the commercial and public sectors, customer satisfaction is a top priority. Achieving greater performance means meeting the requirements of both internal and external customers. (Rampersad, 2001). The bank's performance is heavily influenced by its ability to keep its customers happy (Samar Rahi, 2019). Bank profits are directly related to client happiness. Customer satisfaction, in addition to financial results, influences a company's worth and success (Hariyati, 2019). When customers are happy, companies perform better. According to the author (O'Sullivan, 2012), customers are satisfied when their expectations are met and their requirements are met for obtaining service quality, according to the researcher's perceptions and feelings (Anastasia Golovkova, 2019).

Measuring service quality is intimately linked to customer satisfaction (Mehrdad Estiri, 2011).

As businesses seek to maintain their competitive edge in the marketplace, the problem of service quality is a significant one. The banking industry relies heavily on the quality of service to ensure customer satisfaction. The quality of financial services boosted the performance of the company (Rishi Kant, 2017; Khan & Iqbal, 2020). Banks are using technology advancements to improve their individual and commercial customer service initiatives. Quality services are also associated with higher revenue, customer retention, a stronger cross-sell ratio, and customer satisfaction, which gives banks a significant marketing advantage. As a result, Pakistan's economy relies heavily on the banking industry (Thai, 2017). The agriculture sector generates the majority of Pakistan's export earnings and accounts for around a quarter of the country's total GDP (gross domestic product).

The State Bank of Pakistan and the World Bank have issued regulations on banks and money, and this has resulted in significant growth for Pakistan's banking sector (Prorokowski, 2017). New promotion services that were previously unavailable in Pakistan, including Visa, Electronic Bank Services, and Mobile Banking, are now being offered by banks in Pakistan (Cajetan I. Mbama, 2018). It is customary for financial organization to believe that their clients are at the heart of their services, and hence their operations are influenced by them. However, despite the fact that the banking business has been known to encounter service quality failures and not meet its primary objective (Khan, Tufail, & Ali, 2021).

Research Problem

For the most part, Pakistani banks are still operating under the constraints of outdated software. As a result, their consumers receive substandard service because they lack skilled and experienced workers (Samraz Hafeez, 2012). The importance of customer satisfaction in reorganizing and restructuring capital has been highlighted in previous research, leading banks to seek out investment possibilities in order to remain competitive in the global banking market. In the financial services industry, customer satisfaction has received scant attention in the literature (Hussain, 2016).

Therefore, in this gap, this research empirically investigated the relationships between service quality, customer loyalty, cost of financing, customer satisfaction and with the moderating impact of the quality of financial service in the Pakistani’s conventional bank customer’s context.

Significance of Study

Banks in Pakistan are heavily dependent on government and state bank policies, a strategy that is not usually connected with customer satisfaction. For this reason, this research encourages practitioners to think creatively about how they might improve their customer service. Individuals, institutions, and parties interested in learning more about bank customers' behaviors can benefit from this research. The present political developments in Pakistan are critical in the effort to reform the country's banking sector, which was previously under the authority of an
autocrat whose sole goal was to gain personal wealth at the expense of the country's economic development. Pakistani banks are striving to participate in investment operations in an effort to avert a return to the previous regime by regulating their dealings and reducing competition among financial institutions.

**Literature Review**

**Customer Satisfaction**

Consumer loyalty is defined by Jamal and Naser (2002) as an individual's personal preference or assessment of a product or service's quality. When the arrangement of goods and ventures meets or exceeds customer wants, there is a result: consumer loyalty (Szymanski and Henard, 2001). Paying premiums, referring friends, and using additional products are all things that satisfied customers are eager to do (Reichheld, 1996). Banking success depends on customer loyalty. Consumer loyalty is essential to a bank's bottom line. "The impact of customer loyalty extends much beyond that of money in terms of influencing a firm's reputation and performance" (Le Saout & Daher, 2016). To put it another way, loyalty is a good thing for your business and a good thing for your customers. In recent studies, it has been shown that customer loyalty and business execution have a favourable effect. For the time being, this concept is being overlooked (O'Sullivan, Customer Fulfillment, Profit, 2012).

**Customer Satisfaction and Service Quality**

Effective account management requires high levels of administrative quality in order to build customer loyalty. The firm's performance was boosted by the excellence of its financial management. Consumer loyalty in account management is examined in the evaluation of money-related administrative excellence (Rishi Kant, 2017). Money management quality is dependent on the employee's attitude and on the management of the workforce. Top management is concerned about the quality of financial management in order to achieve the goal of customer loyalty (Elissavet Keisidou, 2013). Financial administration is provided by both public and commercial institutions to ensure customer loyalty. Observed administration quality was identified as the true piece of customer loyalty in the keeping money sector, which focuses on substance, dependability, confirmation, responsiveness, and bank image (Khan, Tufail & Ali, 2021).

**The Banking Sector and Customer Satisfaction**

Among the several written studies on bank customer loyalty in Pakistan, one employed a benchmark that included bank customers from every region and every bank's resources (Elissavet Keisidou, 2013). Inquiries into the clients' satisfaction with the banks were part of the exam. The data was obtained in order to compare the customer satisfaction scores of banks that are interested in the monetary customer fulfillment list. The findings revealed that the most important features that result in fulfillment are reacting quickly to faults and having an amiable manager. The findings also revealed that the arrangement of good, individual administration is seen by consumers as more important than comfort or things (Wahedulhaq, 2014). Customers that participated in the consumer loyalty research purchased more things than those in the control group, according to a recent study conducted in Pakistan as well. When it comes to customers' perceptions of a business, researchers found that review interest was the driving force towards a more positive perception of the company (Gianfranco Walsh, 2008).

**Satisfaction and Loyalty of Customers**

In the money-saving area, customer loyalty is a top priority since it has a direct impact on administration quality and customer satisfaction. When it comes to customer loyalty, there are very few variables that might influence it. Each bank's major concern is retaining and increasing customer loyalty and steadfastness for its own financial gain (Helena Martins Gonçalves, 2012). A bank's ability to maintain a good relationship with its customers is now being recognized as a sign of good business operations and a positive attitude among its employees. Mail and survey
data were used to compile this information. Committed and satisfied employees are more likely to work towards achieving organizational objective that leads to the greater performance of organization (Javeria et al., 2013; Junaid, Bashir, Nasim, & Ahmad, 2021; Khan & Iqbal, 2020)

**Satisfaction and Security of Customers**

Customers' loyalty to a bank is measured in part by how well it protects them. Researchers have found that the account management process revolves around a constant focus on security. An account exchange must be managed securely to reduce the risk to each individual client (Ames Andrew, 2014). Researchers used a meta-examination focused on safety and security as a starting point. Maintaining a safe distance from the dangers associated with bank transactions necessitates the presence of adequate protection for clients. According to a study (Ames and Andrew, 2014), consumer loyalty is directly influenced by the level of client security.

**Conceptual Framework of Customer Satisfaction**

![Conceptual Framework of Customer Satisfaction](image)

**Hypotheses of the Research Model**

Following are the hypothesis that are based on the model and the purpose of the study:

*H1: In the banking sector in Pakistan there is a positive relationship between customer satisfaction and customer cost.*

*H2: In the banking sector in Pakistan there is a positive relationship between customer satisfaction and customer loyalty.*

*H3: In the banking sector in Pakistan there is a positive relationship between customer satisfaction and customer security.*

*There is a positive relationship between financial service quality and customer satisfaction.*

*H5: In the banking sector in Pakistan the quality of financial services moderates the relationship between customer satisfaction and customer cost of financing.*

*H6: Financial Services Quality moderates the relationship between customer loyalty and customer satisfaction.*

*H7: Financial Services quality moderates the relationship between customer satisfaction and*
customer security.

Methodology
The research design is based on the population and sample size of the study. The population of the study is unknown and includes all the customers of the banking sector in Pakistan. The researcher chooses five major Pakistani banks to fill in the study gaps and conduct data analysis. HBL, UBL, MCB and ABL are Pakistan's five largest banks. In order to get an accurate picture of how customers feel about these banks, we surveyed a small group of workers from each of them. More than 400 questionnaires were given to the respondents, 350 of which were returned and 330 of which were filled out correctly. The Smart PLS programme (Joseph F. Hair, 2014) and the Statistical Package for the Social Sciences (SPSS) software were used to evaluate the results (Arkkelin, 2014). The Smart PLS is used to assess all operational variables, while the SPSS programme is used for demographic analysis (Arkkelin, 2014).

Sampling
A thumb rule is used while interviewing survey subjects. The study's 330 completed surveys were a success. The sample size is 330 respondents, and the questionnaire data is gathered on the basis of 10 times the total number of items in the questionnaire. There are 10 times as many questions, according to Barclay et al. (1995). Respondents are staff of Pakistan's five largest banks, who are tasked with gauging customers' perceptions of them.

Sampling Technique
The sampling technique must be chosen at the conclusion of the sample part. It is necessary for a quantitative study to employ both random and convenient sampling methods in order to have a representative sample size. It is easier and less expensive to collect samples using the convenience sampling approach than it would be to utilize alternative methods. It is simple to collect data from a specific population by using convenience sampling.

Instrument of Measurement
In this section, all the variables are explained with the help of items for each variable. Customer satisfaction has eight items. Customer loyalty is evaluated on five items. Financial services quality has seven items. Customer security is evaluated on six items. The cost of financing is evaluated on the basis of the seven items. The questionnaire is designed on the basis of the five-likert scale with options from 1 = Strongly Disagree, 2 = Disagree, 3 = Not Sure, 4 = Agree, 5 = Strongly Agree. The constructs and measurements of the questionnaire are represented in Table 1, which is mentioned below.

<table>
<thead>
<tr>
<th>Construct</th>
<th>Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer Satisfaction</td>
<td>CS 1 This Bank is exactly what customer need for their Business.</td>
</tr>
<tr>
<td></td>
<td>CS 2 The product information presented by this Bank is accurate.</td>
</tr>
<tr>
<td></td>
<td>CS 3 Privacy policies in this Bank are good.</td>
</tr>
<tr>
<td></td>
<td>CS 4 State Bank of Pakistan provides the guarantee of this Bank.</td>
</tr>
<tr>
<td></td>
<td>CS 5 Customers are satisfied with the breadth of banking services.</td>
</tr>
<tr>
<td></td>
<td>CS 6 Customer will be more satisfied if the bank offers Islamic financial services.</td>
</tr>
<tr>
<td></td>
<td>CS 7 Customers are satisfied with the depth of customer services.</td>
</tr>
<tr>
<td></td>
<td>CS 8 overall, customer satisfaction level is good.</td>
</tr>
<tr>
<td>Customer Loyalty</td>
<td>CL 1 Customer will always use this bank in their banking activities/transactions.</td>
</tr>
<tr>
<td></td>
<td>CL 2 Customer will say positive things about this bank to other people.</td>
</tr>
<tr>
<td></td>
<td>CL 3 Customer seldom considers switching away from this bank.</td>
</tr>
</tbody>
</table>
CL 4 Customer will never change this Bank even they found another bank like this. 
CL 5 overall, customer loyalty is good.

| Financial Services Quality | FSQ 1 This Bank offers fast and efficient financial services. |
| FSQ 2 Provision of good financial services helps in retaining the customers. |
| FSQ 3 There is high degree of convenience in financial services of this bank as customer can access the bank services from anywhere in Pakistan. |
| FSQ 4 This bank provides breadth of financial services. |
| FSQ 5 This bank provides depth of financial services. |
| FSQ 6 This bank’s staff is friendly with the customers. |
| FSQ 7 overall, financial services of this bank are good. |

| Customer Security | CST 1 Customer feels safe when using this Bank. |
| CST 2 Performance of the staff is well and it's almost impossible that customer lose their money. |
| CST 3 The Bank cares about safety of its customers. |
| CST 4 The bank is highly concerned with the security of customer transactions. |
| CST 5 The Bank keeps the customer information secret. |
| CST 6 overall, security arrangements are good at this bank. |

| Cost of Financing | COF 1 Loan processing fee is high in this bank. |
| COF 2 Loan documentation charges are high in this bank. |
| COF 3 Legal charges are high in this bank. |
| COF 4 Interest charges are high in this bank. |
| COF 5 Penalty for non-payment of loan is high in this bank. |
| COF 6 Insurance charges for sanctioning of loan are high in this bank. |
| COF 7 Overall, cost of financing is high at this bank. |

Where CS = Customer Satisfaction, CL = Customer Loyalty, FSQ = Financial Services Quality, CST = Customer Security, and COF = Cost of Financing

Results and Discussion

Demographic Information

Demographic variables are termed "control variables." In the questionnaire, respondents' gender, age, marital status, bank, position in the bank hierarchy, working experience, education level, size of bank, and type of bank are asked.

Questionnaire Design and Pretest

The questionnaire technique is adopted for the collection of data for the dependent variable. In the current study, customer satisfaction is a dependent variable which is evaluated by eight items which are adapted after the conduction of interviews and discussion with the customers of five major banks in Pakistan. In the current study, three independent variables are evaluated. The first independent variable is cost of financing, which has seven items. The second is customer security, which is evaluated by six items. The third variable, customer loyalty, has five items. And the fourth variable, which is, moderator financial services quality, has five variables that are adopted after the conduction of interviews and discussion with the customers of five major banks in Pakistan. Reliability is checked through the use of the Smart PLS software (Joseph F. Hair, 2014).

For the pretest, 33 customers were contacted to obtain questionnaire responses from five major banks in Pakistan. I developed the questionnaire so that the questions are related to the variables and the flow of questions is correct. Also, the language of questions is also tested in this section.

Data Gathering

Customer satisfaction, loyalty, customer security, and the cost of financing and financial services quality are all characteristics that are studied in this research. Data is obtained by a five-likert scale questionnaire. Five major Pakistani banks, the NBP, HBL, UBL, MCB, and ABL banks gather data on behalf of their clients from the personnel of these institutions. People are given questionnaires and asked to fill them out in person with a bank employee on behalf of the client to ensure that they provide their permission to answer questions. For those individuals who are
really busy, I've also looked through the questions to ensure their permission.

**Data Analysis Techniques**

After the data has been collected, it is time to examine it. For data analysis (Arkkelin, 2014), Smart PLS-SEM (Partial Least Square) (Joseph F. Hair, 2014) and SPSS Statistic Package for Social Sciences (SPSS) are utilised in the study for data analysis (Arkkelin, 2014). SPSS is a statistical programme used in the social sciences for data analysis. Hair, Joseph F., 2014). Data analysis standards such as data consistency, reliability, and validity can be obtained by using Smart PLS. Other tests for data analysis include fit models, measurement models, path weighing schemes, factor loading, cross loading, reflective measurement models (EMM), and evaluation models (EMV), among others (Joseph F. Hair, 2014).

Throughout the chapter, PLS path models and all their procedural applications are introduced in the first section. The PLS models provide us with a practical application of the criteria of the models in the evaluation of the company's reputation (Joseph F. Hair, 2014). The PLS-SEM allows the researcher to identify the reliability and consistency notions at the beginning of the PLS-SEM measurement models for the purposes of determining dependability and consistency.

**The Measurement Model**

It consists of the different measures that are applied for the measurement of the different formulas and items. The measurement model of the methodology is constrained to the following steps:

- Internal Consistency Reliability (Cronbach Alpha)
- Convergent Validity (Average Variance Extracted AVE)
- Discernment Validity (Fornel-Larcker Criterion)

**Extracted Average Variance (AVE)**

Finding the convergent validity of the established constructs may be done using the average variance extracted model, which is a fundamental technique. An indicator's square outer loading are taken into account while calculating its grand mean. In other words, the AVE's average value is the construct's average value. For the AVE, the same rationale is used as for the other structures. AVE is standardized as an average value of 0.50 or above, which accounts for half of the constructed indicator's value. A different scenario is that the construct will have an incorrect value for AVE if it is less than 0.50. (Joseph F. Hair, 2014).

**Fornell-Larcker Criterion**

For determining discriminant validity, this is the second most commonly used method of measurement. Here, the construct and latent variable correlation AVE values are utilized to compare the square roots of their square roots (Joseph F. Hair, 2014). Because of this, each square root must have a bigger correlation with all the other constructs utilized in the analysis than it does with its own square root value (Joseph F. Hair, 2014). Using this method, you'll look for a construct that has a lot more variance with the corresponding indicator than any other value in the construct (Joseph F. Hair, 2014).

**Demographic Statistics**

| Table 2: Demographic Statistics |
|---------------------------------|----------------|--------|
|                                  | Frequency | Percent |
| GENDER                          |           |        |
| Male                            | 276       | 83.6   |
| Female                          | 54        | 16.4   |
| MARITAL STATUS                  |           |        |
| Single                          | 119       | 36.1   |
| Married                         | 208       | 63.0   |
| Divorced                        | 1         | 0.3    |
| Separated                       | 2         | 0.6    |
According to Table 2, 83.6 percent of surveys were completed by male respondents, whereas 16.4 percent were completed by female respondents. According to the above table, respondents with the marital status single account for 36.1 percent of respondents, while respondents with the marital status married account for 63 percent. Based on the qualification level of the respondents from whom data was collected, it was determined that the majority of questionnaires were filled out by masters. The data demonstrates the population's literacy rate, indicating that the majority of respondents are educated. The masters' proportion is 76.7 percent, which is the highest in the evaluated data.

**Structure Equation Modeling (PLS-SEM Approach)**

The research study's result is arrived at using statistical procedures. During the study, Smart PLS software is used to do the data analysis. When analysing data in marketing investigations as previously said, Smart PLS is employed extensively (Mena, 2011). System 1 and System 2 of the PLS are the two main divisions. While Convince Based SEM was used for research analysis in the past, after discovering a few flaws in the CB-SEM, PLS-SEM was developed. Partially least squares structure, which has recently emerged as a more contemporary alternative in recent years (Mena, 2011). Smart PLS 3.0 is used to perform data analysis.

The smart PLS has put a lot of emphasis on meeting the demands of researchers by figuring out how to identify the implications of their findings, which is the root of the problem. Detailed instructions on how to utilise the PLS are supplied. Using the paper, researchers may do in-depth critical analysis, correctly evaluate study findings, and draw conclusions about the validity of those findings (Mena, 2011). Based on either reflective or formative models, the measuring model is either a combination of both or neither. For the purpose of selecting candidates, Oliver G. otz (2010) used theoretical work to determine whether to use the formative or reflective approach.

**Factor Loading**

Factor loading is a method for determining an item's reliability. The standard rule of thumb for factor loading is a number greater than 0.60 or above (Joseph F. Hair, 2014). Whenever the individual factor loading value exceeds 0.60, each item must be examined for factor loading. The...
PLS SEM was used to determine the outer loading values of all the study data. The validity and reliability of constructs are shown in Table 3. Furthermore, the validity and dependability of the data seem to be white noise.

### Table 3: Construct Validity and Reliability

<table>
<thead>
<tr>
<th>Variable</th>
<th>Cronbach's Alpha</th>
<th>Composite Reliability</th>
</tr>
</thead>
<tbody>
<tr>
<td>CL</td>
<td>0.746</td>
<td>0.809</td>
</tr>
<tr>
<td>COF</td>
<td>0.881</td>
<td>0.908</td>
</tr>
<tr>
<td>CS</td>
<td>0.890</td>
<td>0.912</td>
</tr>
<tr>
<td>CST</td>
<td>0.864</td>
<td>0.897</td>
</tr>
<tr>
<td>FSQ</td>
<td>0.799</td>
<td>0.858</td>
</tr>
</tbody>
</table>

CL = Customer Loyalty, COF = Cost of Financing, CS = Customer Satisfaction, CST = Customer Security, FSQ = Financial Services Quality

In the second step the researcher have to focus on the AVE value. The average variance model value AVE is the form of convergent validity, the paper defines the convergent validity according to the classical theory test which suggests that convergent validity value is between the correlations of the same constructs (Oliver Götz, 2010). Therefore while measuring the AVE value the researcher face many problems for the evaluation of the variance for the same construct. AVE focus the variance of the indicators from the construct related to the total amount of variance, the calculated variance includes the measurement error (Oliver Götz, 2010). The rule of thumb for the AVE is if the value is below 0.5 it is considered as insufficient value above 0.5 is accepted (Oliver Götz, 2010). The AVE values are mentioned below in the Table 4.

### Table 4: Average Variance Extracted

<table>
<thead>
<tr>
<th>Variable</th>
<th>Average Variance Extracted (AVE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CL</td>
<td>0.586</td>
</tr>
<tr>
<td>COF</td>
<td>0.585</td>
</tr>
<tr>
<td>CS</td>
<td>0.567</td>
</tr>
<tr>
<td>CST</td>
<td>0.594</td>
</tr>
<tr>
<td>FSQ</td>
<td>0.501</td>
</tr>
<tr>
<td>Moderating Effect 1</td>
<td>1.000</td>
</tr>
<tr>
<td>Moderating Effect 2</td>
<td>1.000</td>
</tr>
<tr>
<td>Moderating Effect 3</td>
<td>1.000</td>
</tr>
</tbody>
</table>

CL = Customer Loyalty, COF = Cost of Financing, CS = Customer Satisfaction, CST = Customer Security, FSQ = Financial Services Quality

Table 8 indicates the AVE values for the discriminant validity for the Customer loyalty 0.586, AVE value for the cost of financing 0.585 and AVE value for the customer satisfaction is 0.567, AVE value for the customer security 0.594 and the AVE value for the moderator financial services quality 0.501. The rule of thumb for the AVE average variance extracted is 0.5. All the values in the table 8 are above from the standard value 0.5 it clarify that the data is according to the rule of thumb.
AVE discriminant validity values are shown in Figure 2 based on the values computed for the various constructs. For the AVE variance, the table shows that all of the bars are over the median line of 0.5. The bars for customer loyalty, cost of financing, customer satisfaction, customer security, and the quality of financial services are all above the mean point, while the bar for moderating effects is close to the 1.0 mark, indicating that the moderator has a positive effect on all independent variables. There are no discrepancies in the AVE values shown in Figure 2, which means the study is genuine.

Cross Loading
The cross loading approach along with AVE values is used to determine the discriminant validity. Every loading has an indication with a higher value than the one meant to load, according to this rule (Mena, 2011). When employing the Fornell-Larcker, the AVE should be greater than the other correlation in order to verify the discriminant validity. Cross loading or the Fornell-Larcker technique may be used to process the rule of thumb (Mena, 2011). Table 5 shows the cross loading values derived using Partial Least Squares (PLS).
Discriminant validity may be demonstrated by comparing the latent variable AVE to the squared correlations of the squared correlations that are connected to the construct's latent variable AVE (Mena, 2011). The reflecting measurement validation procedure was finished when the discriminant validity process was completed. The reflecting measurement model illustrates that this is the conclusion of the whole validation procedure for the constructs. Table 6 displays the results of the study as they were obtained using the PLS SEM and its output graph 3.0outputs and Fornell-Larcker values.

<table>
<thead>
<tr>
<th>Variable</th>
<th>CL</th>
<th>COF</th>
<th>CS</th>
<th>CST</th>
<th>FSQ</th>
<th>Moderating Effect 1</th>
<th>Moderating Effect 2</th>
<th>Moderating Effect 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>CL</td>
<td>0.766</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COF</td>
<td>0.397</td>
<td>0.765</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CS</td>
<td>0.744</td>
<td>0.518</td>
<td>0.753</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CST</td>
<td>0.409</td>
<td>0.716</td>
<td>0.522</td>
<td>0.771</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FSQ</td>
<td>0.705</td>
<td>0.507</td>
<td>0.695</td>
<td>0.490</td>
<td>0.708</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Fornell-Larcker Criterion</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

After the Fornell Larcker measures, Table 10 indicates the values acquired, which are bold in the table, which illustrates the criterion specified for the correlations that the squared value of each AVE of a certain construct is greater than the other construct value (Joseph F. Hair, 2014). According to the table, each construct has a higher correlation than the other constructs.
The factor loading values for the individual indicators for the constructs employed in the study are shown in Figure 3. A value higher or equal to 0.7 implies that all constructions are positive and conform to industry standards, as seen in figure 3. Figure 3 illustrates a positive moderator relationship; in this example, the moderator is the quality of financial services. As seen by the moderate variable's value of 2.538, the moderator has a moderate value.

Factor loading values for some constructs are removed which have the values below 0.4 are removed from the study. Financial services quality has the seven constructs as per the factor loading. The constructs include customer satisfaction include eight items as per the factor loading., cost of financing constructs the seven items, customer loyalty construct the three items and customer security construct the six items whose values are determined after the values of factor loading.

**Conclusion**

There was a significant relationship between the study's primary goal and its secondary goal, and both were met. The customer satisfaction is the most important consideration in this study of conventional banks. Customers' levels of satisfaction in Pakistani commercial banking were examined in depth. This finding suggests that customer loyalty is the most important influence on customer satisfaction. According to the findings, customer satisfaction rises when the cost of financing the bank's product is minimal. In addition to improving the independent variable, customer happiness, ensuring customers' safety has a favourable effect on it as well. The quality of financial services is employed as a moderator in this study, which has a substantial influence on the independent variables: cost of financing, customer loyalty, and customer security, and the dependent variable, consumer happiness (Daniel J. Petzer, 2017).

That banking is a crucial part and financial services quality is critical in the banking sector of
Pakistan is evident from this study's findings. No bank can achieve customer happiness unless it improves the quality of its financial services (Dibrova, 2017). Methods for maximization the use of financial resources for the betterment of society are numerous. It was decided to apply the Data Envelope Analysis (also known as the DEA method) for the analysis of the research article.

**Policy Recommendations**
There is additional motivation for practitioners in this study because of the researcher's emphasis on finding new ways of improving customer service and pursuing change in the services supplied. The findings of this study suggest the best strategies for managers to apply in their organizations in order to make the most of the company's financial resources.

**Limitations and Future Directions**
Only five main Pakistani banks were examined in this study owing to a lack of resources and time. However, a similar study might be undertaken in the future among Pakistan's other bank clients and in scenarios from across the world. This analysis relied on information from Pakistan's five largest banks because of a lack of resources and a timing crunch. In terms of gender-based research, the data obtained from both male and female respondents is not evenly distributed across the two primary sexes. In the future, data from respondents from both the dominant sexes might be collected on an equality basis. For the time being, the data is only gathered from medium and large-sized and private/public institutions, but in the future, it may be collected from smaller and overseas institutions. In the fifth and final section, the questionnaire technique is used to gather data; in the future, other data collection methods may be used, such as the survey-based approach or the quantitative form of data collecting.

**References**
Hariyati, B. T., Noorlailie Soewarno. (2019). The mediating effect of intellectual capital, management accounting information systems, internal process performance, and customer


Financial Inclusion between Financial Innovation and Economic Growth: A Study of Lower Middle Income Economies

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Qaisar Ali Malik, Faculty of Management Sciences, Foundation University Islamabad, Pakistan

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ABSTRACT

Purpose: Financial inclusion is a key concern that has achieved much impulsion in the last two decades internationally. It has the scope of reporting of financial scheme and institutions to the underserved community in the economy. This study examined the effect of financial innovation on economic growth with the mediation of financial inclusion.

Design/Methodology/Approach: To address the relationship researchers in this study have used measures from a dataset of low and lower middle income group economies over a sample period from 2010-2017.

Findings: The results of this study shows that financial innovation creates opportunities for financially excluded segment of the society which results in financial inclusion that leads to economic growth of low and lower middle economies.

Implications/Originality/Value: Study will provide new evidence that contributes new ways to improve low and lower middle economies towards economic growth by promoting financial innovation and financial inclusion.

Introduction

Financial inclusion has turn out to be an imperative approach following the recent worldwide financial predicament. Financial inclusion has acknowledged a lot of deliberation since the late 1990s, as the guiding principle making matter of generally expelled community and many researches concerning the financial exclusion of generally excluded public has materialized (Leyshon & Thrift 1993; 1994; 1995; Collard 2010). The growth of financial inclusion according to the household savings, capital growth, technological modernization, increase in income, and financial willpower is playing vital role in economic growth. Financial inclusion is the way to variety of valued financial product and financial services have developed into focus of substantial attention intended for governments, researchers, and public. Financial inclusion helps economies to cope up with the recent economic challenges and achieve economic stability and growth.
Financial inclusion applies a gigantic effect on economic development through remunerations resulting from the access of financial product and services to the individuals in the economy. According to Alliance for Financial Inclusion, (2015) improvement in financial inclusion and business development offer massive benefits to in general whole economy in context of employment prospect and tax expenses that add to the nationalized revenues. There is a need for understanding the association among financial inclusion with economic growth. It has turn out to be a noteworthy apprehension in national development. Financial innovation is the course of action of generating innovative financial technologies offered by financial institutions. Financial innovation includes institutional aspect, product base aspect, and the process aspect. Financial innovation develops the provision of financial products and financial services and also improves access to financial services and financial product (Lee et.al. 2019). Many researchers verified that financial innovation is positively connected with the national economic growth (Laeven, Levine, & Michalopoulos, 2015; Beck, Chen, Lin, & Song, 2016).

Financial innovations include mobile wallets that are making cashless payments more suitable, quick and valuable to customer and to encourage a further frequent utilization of non-cash mechanism (Semerikova, 2019). A financial innovation raises the reimbursement to the individuals by civilizing the excellence of the understanding of using cashless payments mechanism. When people recognized financial innovations as simple and easier to apply as a result they may possibly implement them quickly and employ them regularly (Loh et al., 2019; Liu et al., 2020). Miller in 1986 had found financial innovation is considered as a vital ingredient of the economic scenery (Tufano, 2003). Financial innovation is act of creation, continuing research and development, dissemination or implementation of innovative financial product, financial services or financial thoughts (Tufano, 2003). Kim et al. (2018) found that there is a noteworthy association between financial inclusion and economic growth in Organization of Islamic Cooperation (OIC) economies. In the financial markets, financial innovation is considered as a way to reduce interior and exterior financial restriction (Silber, 1983) to accomplish superior economic competence (Merton, 1995, Laeven et al., 2015).

Monetary policy rate have long term effect on real rates primarily through alteration in investors’ risk-taking activities and their impact on premiums (Hanson and Stein, 2015). Nakamura and Steinsson (2018) found in their study that monetary policy revelation direct to re-evaluations regarding the economy and consequently have a tendency to shift the predictable rates constituent of medium and long term yields. Monetary policy choices are arrived on the foundation of agreement (Hammond, 2012) after allowing for key economic growth that creates risk of inflation.

The insurance market saturation is measured to be a necessary ingredient of financial inclusion which directs the economy to economic growth (Pradhan et al., 2016). Boukhatem (2016) considered that the persistence of the effect of financial inclusion on economic growth that includes reduction in poverty. Financial inclusion accepted as a method that scripts progression in capacity, value, effectiveness and competence of conciliator financial services, which assist in improving lives, promote opportunity and fortify economies. Savings at local level are encouraged all the way through financial inclusion which leads to improved, productive and fruitful investments in local industry (Mlambo and Ncube, 2011; Babajide et al., 2015; Arun and Kamath, 2015).

Research studies found the connection of financial inclusion with economic growth, financial inclusion with economic steadiness, and discrimination (Sahay et al., 2015). As a result of financial inclusion there is increased in access of financial products and services by businesses and households that lead to enhanced economic growth. Low level of financial inclusion leads to negative or low economic growth in some developed economies. Increasing access to financial
products and services other than credit was institute to be valuable to development to financial stability. This study contributes to existing literature through variables under study financial innovation, monetary policy rate impact on financial inclusion that contributes towards economic growth in low and lower middle income economies. This study will also provide new evidence that contributes new ways to improve low and lower middle economies towards economic growth by promoting financial innovation and financial inclusion.

**Empirical Framework**

The model of the study is as follows:

\[ FG_{it} = \beta_0 + \beta_1 FINN_{it} + \beta_2 MPR_{it} + \epsilon_{it} \]  
………………………………………………………………………………….equation (1)

For Mediation:

\[ FG_{it} = \beta_0 + \beta_1 FI_{it} + \beta_2 MPR_{it} + \epsilon_{it} \]  
………………………………………………………………………………….equation (2)

\[ FG_{it} = \beta_0 + \beta_1 FINN_{it} + \beta_2 MPR_{it} + \epsilon_{it} \]  
………………………………………………………………………………….equation (3)

\[ FG_{it} = \beta_0 + \beta_1 FINN_{it} + \beta_2 FI + \beta_3 MPR_{it} + \epsilon_{it} \]  
………………………………………………………………………………….equation (4)

**Research Design**

Secondary data has been utilized for the analysis of variable. Secondary data of financial innovation, monetary policy rate, financial inclusion and economic growth has been collected through Global Findex Database, international financial statistics and World Bank development indicators. Quantitative research method has been used in this study. The units of analysis for the study were low and lower middle income economies. A total sample size of study is 500. This study use data of 50 countries over the year 2010-2019. Furthermore, convenient sampling technique has been used in selecting the sample. Deductive approach has been used for quantitative data analysis.

The measures used for financial inclusion includes penetration, availability and usage. Penetration includes number of financial institutes per 10,000 people calculated as total number of financial institutes divided by residents of country, number of bank staff per 10,000 people calculated as total number of bank staff divided by residents of country, number of financial institutes per 10,000 square kilometer calculated as total number of financial institutes divided by region and number of bank staff per 10,000 square kilometer calculated as total number of bank staff divided by area. Availability includes savings deposit per capita calculated as savings deposit divided by residents of country, loans per capita calculated as loan divided by residents of country and insurance density calculated as quality income divided by residents of country. Usage includes deposit ratio calculated as deposit divided by GDP, loan ratio calculated as loan divided by GDP and insurance depth calculated as quality revenue divided by GDP. Financial innovation measures as ratio of Narrow-to-Broad money. Real GDP per capital is used as a proxy of economic growth.
Empirical Results and Discussion
The mean, minimum, maximum, minimum and standard deviation value for financial innovation, monetary policy, financial inclusion and economic growth is described in table 1.

Table 1: Descriptive Statistics

<table>
<thead>
<tr>
<th>Financial Innovation</th>
<th>Monetary Policy Rate</th>
<th>Total Number of Financial Institutions / Residents of Country</th>
<th>Total Number Of Bank Staff / Residents Of Country</th>
<th>Total Number Of Financial Institutions /Region</th>
<th>Savings Deposit / Residents Of Country</th>
<th>Loan / Residents Of Country</th>
<th>Quality Income / Residents Of Country</th>
<th>Deposits / GDP</th>
<th>Loan / GDP</th>
<th>Quality Revenue / GDP</th>
<th>Economic Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>3.64</td>
<td>12.05</td>
<td>0.09</td>
<td>0.08</td>
<td>0.03</td>
<td>0.02</td>
<td>0.08</td>
<td>0.07</td>
<td>0.06</td>
<td>0.97</td>
<td>1.09</td>
</tr>
<tr>
<td>Maximum</td>
<td>4.28</td>
<td>15.00</td>
<td>0.11</td>
<td>2.33</td>
<td>0.03</td>
<td>0.02</td>
<td>0.08</td>
<td>0.11</td>
<td>0.11</td>
<td>0.83</td>
<td>1.13</td>
</tr>
<tr>
<td>Minimum</td>
<td>2.55</td>
<td>9.00</td>
<td>0.03</td>
<td>0.03</td>
<td>0.03</td>
<td>0.02</td>
<td>0.03</td>
<td>0.03</td>
<td>0.23</td>
<td>0.26</td>
<td>-1.96</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>0.33</td>
<td>0.84</td>
<td>0.28</td>
<td>0.36</td>
<td>0.35</td>
<td>0.07</td>
<td>0.03</td>
<td>0.91</td>
<td>0.81</td>
<td>1.25</td>
<td>0.78</td>
</tr>
</tbody>
</table>

Table 2 describes the correlation among variables. There is positive significant relationship among financial innovation and economic growth. Results also show positive significant relationship among financial innovation and financial inclusion. Financial inclusion and economic growth shows positive significant connection. Results of this study show that introducing new innovative financial products and services leads to financial inclusion which directs the economy to economic growth. Financial innovation initiates innovative financial organizations, innovative financial products and better financial services that are preeminent in explaining the effect of financial innovation on economic growth through mediation of financial inclusion (Chou & Chin, 2011; Wachtel, 2003).
<table>
<thead>
<tr>
<th>Variables</th>
<th>Financial Innovation</th>
<th>Monetary Policy Rate</th>
<th>total number of financial institutes / residents of country</th>
<th>total number of bank staff / residents of country</th>
<th>total number of financial institutes / region</th>
<th>total number of bank staff / area</th>
<th>savings deposit / residents of country</th>
<th>loan / residents of country</th>
<th>quality income/residents of country</th>
<th>deposit / GDP</th>
<th>loan / GDP</th>
<th>quality revenue / GDP</th>
<th>Economic Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial Innovation</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<td></td>
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</tr>
<tr>
<td>Monetary Policy Rate</td>
<td>1.48</td>
<td>-0.15</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>total number of financial institutes / residents of country</td>
<td>-1.43</td>
<td>1.98</td>
<td>1</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>-0.15</td>
<td>(0.04**)</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>total number of bank staff / residents of country</td>
<td>2.28</td>
<td>-2.59</td>
<td>-0.06</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(0.02**)</td>
<td>(0.01*)</td>
<td>-0.94</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>total number of financial institutes / region</td>
<td>-1.13</td>
<td>0.84</td>
<td>0.31</td>
<td>2.39</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>-0.26</td>
<td>-0.75</td>
<td>(0.01*)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>total number of bank staff / area</td>
<td>-1.8</td>
<td>-1.36</td>
<td>0.56</td>
<td>0.1</td>
<td>0.12</td>
<td>1</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(0.07**)</td>
<td>-0.17</td>
<td>-0.57</td>
<td>-0.92</td>
<td>-0.94</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>savings deposit / residents of country</td>
<td>1.99</td>
<td>-0.05</td>
<td>1.15</td>
<td>-1.49</td>
<td>-0.06</td>
<td>2.51</td>
<td>1</td>
<td></td>
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<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(0.04**)</td>
<td>-0.95</td>
<td>-0.25</td>
<td>-0.13</td>
<td>-0.94</td>
<td>(0.01*)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>loan / residents of country</td>
<td>1.08</td>
<td>2.57</td>
<td>1.73</td>
<td>-1.5</td>
<td>0.88</td>
<td>-1.16</td>
<td>-0.25</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(0.01*)</td>
<td>(0.08***</td>
<td>-0.13</td>
<td>-0.37</td>
<td>-0.24</td>
<td>-0.79</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>quality income/residents of country</td>
<td>0.17</td>
<td>0.88</td>
<td>-1.25</td>
<td>-0.33</td>
<td>0</td>
<td>0.88</td>
<td>0.39</td>
<td>1.73</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(0.07**)</td>
<td>-0.17</td>
<td>-0.57</td>
<td>-0.92</td>
<td>-0.94</td>
<td>(0.01*)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>deposits / GDP</td>
<td>0.46</td>
<td>-0.07</td>
<td>-2.47</td>
<td>0.09</td>
<td>-0.67</td>
<td>-0.72</td>
<td>0.79</td>
<td>-1.25</td>
<td>2.39</td>
<td>1</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>(0.01*)</td>
<td>-0.92</td>
<td>-0.5</td>
<td>-0.47</td>
<td>-0.43</td>
<td>-0.21</td>
<td>(0.01*)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>loan / GDP</td>
<td>18.98</td>
<td>0.82</td>
<td>-0.8</td>
<td>-1.35</td>
<td>-0.42</td>
<td>-1.12</td>
<td>1.39</td>
<td>-2.47</td>
<td>2.57</td>
<td>-1.07</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(0.00*)</td>
<td>-0.41</td>
<td>-0.42</td>
<td>-0.17</td>
<td>-0.66</td>
<td>-0.26</td>
<td>-0.16</td>
<td>(0.01*)</td>
<td>(0.01*)</td>
<td>-0.28</td>
<td></td>
</tr>
<tr>
<td>quality revenue / GDP</td>
<td>1.98</td>
<td>-0.33</td>
<td>0.57</td>
<td>-0.48</td>
<td>0.19</td>
<td>0.96</td>
<td>1.09</td>
<td>-0.8</td>
<td>0.88</td>
<td>0.22</td>
<td>0.88</td>
<td>1</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>(0.04**)</td>
<td>-0.73</td>
<td>-0.56</td>
<td>-0.62</td>
<td>-0.84</td>
<td>-0.33</td>
<td>-0.27</td>
<td>-0.42</td>
<td>-0.37</td>
<td>-0.82</td>
<td>-0.37</td>
</tr>
<tr>
<td>Economic</td>
<td>2.59**</td>
<td>0.32</td>
<td>0.76*</td>
<td>-0.08</td>
<td>0.95**</td>
<td>-0.28</td>
<td>-0.77</td>
<td>0.57</td>
<td>0.07</td>
<td>0.46*</td>
<td>0.62*</td>
<td>0.11**</td>
<td>1</td>
</tr>
</tbody>
</table>
Table 2. Correlation Coefficient and probability of Variables. This table shows the correlation matrix. Coefficients are illustrated. Asterisks show the significance of variables at 0.01, 0.05 and 0.10 levels.

Table 3. Dependent Variable is Economic Growth – Analysis without Mediation

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial Innovation</td>
<td>-2.34E-11</td>
<td>0.4411</td>
</tr>
<tr>
<td>Monetary Policy Rate</td>
<td>0.789731</td>
<td>0.03</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.110</td>
<td></td>
</tr>
<tr>
<td>Adjusted R-squared</td>
<td>0.109</td>
<td></td>
</tr>
<tr>
<td>F-statistic</td>
<td>10.549</td>
<td></td>
</tr>
<tr>
<td>Prob(F-statistic)</td>
<td>0.000</td>
<td></td>
</tr>
</tbody>
</table>

Table 4. Dependent Variable is Economic Growth – Detailed Mediation Analysis

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial Innovation</td>
<td>2.64E-10</td>
<td>0.03</td>
</tr>
<tr>
<td>Monetary Policy Rate</td>
<td>-1.24E-18</td>
<td>0.08</td>
</tr>
<tr>
<td>total number of financial institutes / residents of country</td>
<td>0.030</td>
<td>0.36</td>
</tr>
<tr>
<td>total number of bank staff / residents of country</td>
<td>96.234</td>
<td>0.4</td>
</tr>
<tr>
<td>total number of financial institutes /region</td>
<td>-56.903</td>
<td>0.00</td>
</tr>
<tr>
<td>total number of bank staff / area</td>
<td>-0.359</td>
<td>0.84</td>
</tr>
<tr>
<td>savings deposit / residents of country</td>
<td>11.140</td>
<td>0.01</td>
</tr>
<tr>
<td>loan / residents of country</td>
<td>459.829</td>
<td>0.00</td>
</tr>
<tr>
<td>quality income / residents of country</td>
<td>37.770</td>
<td>0.04</td>
</tr>
<tr>
<td>deposit / GDP</td>
<td>6.28E-11</td>
<td>0.01</td>
</tr>
<tr>
<td>loan / GDP</td>
<td>-2.14E-20</td>
<td>0.07</td>
</tr>
<tr>
<td>quality revenue / GDP</td>
<td>0.0215</td>
<td>0.02</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.3590</td>
<td></td>
</tr>
<tr>
<td>Adjusted R-squared</td>
<td>0.4586</td>
<td></td>
</tr>
<tr>
<td>F-statistic</td>
<td>2.866</td>
<td></td>
</tr>
<tr>
<td>Prob(F-statistic)</td>
<td>0.035</td>
<td></td>
</tr>
</tbody>
</table>
Probability value is seen for accepting or rejecting the hypothesis. P value should be equal or less than 0.01 at 1% confidence interval level, equal or less than 0.05 at 5% confidence interval level and equal or less than 0.10 at 10% confidence interval level. Financial Innovation has significant impact on economic growth. Monetary policy rate is taken as a control variable and has significant impact on economic growth at 10% confidence interval level. Table 3 and table 4 shows the regression analysis for the model. There is significant relation among independent variable financial innovation, mediating variable financial inclusion and dependent variable economic growth.

**Conclusion**

Financial innovation leads to effective and efficient an economic system that is principally imperative for supporting economic development for the reason that the effectiveness of investment will take the limelight the amount of investment is the driver of the economic growth (Qamruzzaman & Jianguo, 2018). Financial innovation develops the financial sector of the economy that brings together all stakeholders in the financial system to create better economic system. It improves the economic growth and economic wealth for the economic stakeholders. Financial innovation adds up financially excluded segment of the economy. As financial innovation creates the innovative variety of financial products and services that is attractive for many economics stakeholders which results in financial inclusion that leads to economic growth. This study results certified that financial innovation leads to financial inclusion which results in economic growth. The findings of this study drawn attention to new research areas. First this model can also be tested on other categories of economies. Mixed research method that is primary and secondary data can be incorporated in future research studies for better results. Qualitative research can also be carried out for triangulation purpose. New micro and macro level variables can also be introduced in existing model.

**References**


Demirguc-Kunt, Klapper, and Singer (2012), by promoting financial inclusion, we help address and reduce inequalities, thereby reducing poverty and improving economic development.


Islamic Banking Prospects, Challenges, and Criticism- A Systematic Literature Review

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JEL Classification
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ABSTRACT

Purpose: The article covers the prospects, challenges and criticism of Islamic Banking. There is still a confusion among people about the differences in Islamic and commercial banking. The implementation of Islamic banking is not as per the true spirit with which it was started.

Methodology/Approach: A systematic literature review was conducted and a thorough research was carried out by studying 2725 articles and finally qualifying thirty articles (30 articles) for the review.

Findings: The results revealed that there is still a confusion among people regarding the difference between Islamic and Conventional banking. The Islamic banks should organize more awareness programs to improve the knowledge of people regarding Islamic banks. The social objectives of Islamic banks are not highlighted from their operations.

Implications/Originality/Value: This article contributes to the literature by giving important insights regarding the Islamic Banking industry. The Islamic Banks can definitely improve by adopting the suggestions given in paper.

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Introduction

The number of Islamic financial institutions is 300 in over 75 countries, mainly located in the Middle East and Southeast Asia. Islamic banking has gained acceptance in Europe, the USA, and Africa and is now present in every continent. Islamic bank's acceptance is very good and some western banks have also opened up the Islamic Banking window(Ezeh & Nkamnebe, 2018). The transactions of Islamic banks in different Muslim countries like Iran, Sudan, and Malaysia provide evidence of Islamic banks offering a good banking solution.

Islamic banking appeared in the twentieth century and has grown in the last 20 years. This
success is associated with free capital flow and the responsiveness of Muslims to the consequences of interest-centered dealings in their religion. The move from the traditional banking system to the Islamic Banking system is demonstrated by a perception to shift from a mortgage-based financial system to a fairly built plan. Islamic bank assets were valued at more than US $ 2tn in 2015, and the number of Islamic banks operating worldwide exceeded 775 numbers. Pakistan is also striving hard to promote Islamic banks and this can be seen in the growth of Islamic bank branches from 150 in 2007 to 2146 in 2016. (Majeed & Zainab, 2018)

Islamic Bank growth and financial progress were studied by taking data from 52 countries from 1990-2010. Results reveal that Islamic banking is connected with economic development. The key avenue of transmittal includes capital gathering and better financial addition, particularly improved connection to deposits. Islamic countries suffering from low growth must develop this banking sector by updating the judicial, controlling, and developing better infrastructure. Similarly Islamic banking adopted by non-muslim countries also helps them in the growth of their economies. (Imam & Kpodar, 2016)

Islamic banking is an evolving invention in Nigeria; and has emerged as a new truth in the financial system of Nigeria (Ezeh & Nkamnebe, 2018). The researchers recognized 12 independent variables namely provisional preference, congeniality, intricacy, believability, durability, vagueness, advertising effort, perception, customer pre-occupation, anticipated information worth, profit/ loss allocation, and religiousness as appropriate variables for the investigation of Islamic bank acceptance in Nigeria. Islamic banking is a contemporary and new product and is dissimilar from traditional banking, it is expected that upon implementation of the conceptual framework it will provide a very valuable understanding of the embracing behavior of Islamic bank customers in Nigeria.

Islamic banking advocates provision, financing, more authority, and rationality in every facet of society. During economic trouble, Islamic banking remains steadfast due to resource-backed and sustained resource financing in its goods (Ahmad, Farooq, & Imran, 2021). There is a growing trend in the Islamic banking market and its market segment is growing. Islamic Banking as defined by the State Bank of Pakistan is banking done in conformity with Islamic directions. The primary purpose of the Islamic Banking system is to eradicate RIBA from society by presenting Islamic funding goods. The Shariah board is the consultative board in Islamic banks. Regardless of all the Islamic financing steps taken by the Islamic bank, many Islamic intellectuals argue that they do not pursue the actual vigor of Shariah, nor do they offer transaction-backed products. Research shows that customers are ready to invest in profit and loss sharing products but the problem they face is a lack of knowledge on its operations. Islamic banks are reluctant to offer Musharika products due to increased danger and agency issues. Ultimately, Islamic banks are unable to implement Musharika financing. (Ahmad & Imran, 2021)

**Significance**
This study will help students, researchers, academicians, bankers to understand the prospects, challenges, criticism, and opportunities that exist in the market for Islamic Banks. The study will help all these stakeholders to work towards the betterment of Islamic banking in uplifting the economy as a whole.

**Contribution**
The study will add to the current body of knowledge by giving answers to the following questions:
Q1. What are the opportunities or prospects that are available to Islamic banks?
Q3. What are the challenges which are faced by Islamic banks the world over?
Q4. What criticism is faced by Islamic banks?
Chapter 2 Methodology

Method

The main purpose of this review is to consolidate, investigate, and generate literature available on Islamic Banking and Finance. The systematic review is mainly aimed at (i) Describing the recognized researches; (ii) classify and categorize the notable researches according to their central plan and their technical means; (iii) carry a serious assessment on the process and (iv) to pull key inference for proposed investigation (Qureshi, Aleemi, & Hyder, 2019).

Sources of Information and Search Strategy

A systematic literature search was conducted in the database, namely Crossref, Google Scholar, Harzinger publish and perish used to take out most of the articles from the best journals. Articles from Journals such as Elsevier, Springer, Taylor, and Francis, Research gate were selected. Search terms included the following terms 1) Islamic Banking Prospects 2.) Islamic Banking Challenges 3.) Islamic Banking Criticism.

<table>
<thead>
<tr>
<th>Search Terms</th>
<th>Construct</th>
<th>Scope</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Islamic Banking Prospects, Islamic Banking Challenges, Islamic Banking Criticism</td>
<td>Islamic Banking</td>
<td>Islamic Banking and Finance</td>
<td>All Islamic Banks Worldwide</td>
</tr>
</tbody>
</table>

Inclusion and Exclusion Criteria

Search Criteria

Inclusion criteria of articles are given as under:
Research articles published in impact factor journals in the English language
Articles published on the subject of Islamic Banking growth prospects, Islamic Banking Challenges and Islamic Banking criticism all included in the scope of the study
Variables included in the study should be related to the topic or the problem and not to any other topic or problem
Articles related to Islamic Banks were only included and articles related to conventional banks were not included

Exclusion criteria of articles are given below:
Articles not accessible were not included in the study
Articles published in a language other than English were not included
Conference proceedings
M.Phil and Ph.D. level thesis

Screening

Articles were screened based on inclusion criteria. Initially, the abstracts and titles were reviewed and articles selected. Some of the articles which came up during article searches were not related but were evaluated separately to see if they can be included.

Quality Review

Selected studies were further polished through a quality review instrument known as the "Mixed Methods Appraisal Tool (MMAT)"

Results

A thorough search was carried out by following the search criteria as given in the search strategy. Total records selected included 2725 research articles. By following the search criteria 225 articles were found eligible. These 225 articles were further screened and finally, 30 articles were selected for the systematic review. Below is a Prisma diagram showing the screening of articles.
Classification of Prospects, Challenges, Opportunities, and Criticism of Islamic Banking

Prospects of Islamic Banking

Islamic Banking awareness programs will create interest among the people. Most people due to unawareness are unable to understand the benefits of Islamic banking. It is therefore recommended that Islamic banks must launch awareness campaigns to educate people and it will help them in attracting more and more customers. (Blackwell et al, 2006; Dabor Aggreh, 2018; Shabbir & Rahman, 2019). There is a need for Islamic banking in Non-Muslim countries. Many banks are ready to shift to Islamic Banking due to zero interest (Ahmed, 2008.; Dabor & Aggreh, 2018). Islamic banks should arrange some facilities for the disadvantaged and neglected people as this will improve their customer base and also provide chances for the economy to grow (Shaikh, 2018; Shaikh et al., 2017). Islamic banks should try to expand in OIC countries as the percentage of account holders in these countries is very low and most of the people in these countries are disadvantaged. By providing soft loans to such a segment of society will allow Islamic banks to contribute to the development of an economy. Islamic Banking can help in the reduction of poverty by financing poor people through special funds. This special advantage can be the source of attraction for many governments who want to eradicate poverty from their system. (Dabor & Aggrreh, 2018; Wajdi Dusuki, 2008).

Ezeh & Nkamnebe, (2019) investigated the chances of Islamic Banking in the south of Nigeria where the Non-Muslim population prevails. The decision of the Central Bank of Nigeria to accept the opening of the Islamic Banking operation was acknowledged by many with dubiousness. The Non-Muslims thought that Islamic Banking would never benefit them as it has aspects of Sharia in it. Some aspects of Islamic banks were proficient among Jews and Christians and advanced supported by socialist and financial experts. Religion set aside, communists denounced interest, as it strengthens a sponging survival. Interest has a very adverse influence on society. The author after a thorough literature review has made a structure for this study. The plan includes the following variables Information on Islamic Banking, Comparative benefit of Islamic Banking, prospective client religious affiliation, and views of Islamic banks.
Information on Islamic Banking  
Research suggests (Blackwell et al, 2006; Dabor & Aggreh, 2018; Shabbir & Rahman, 2019) that the buying commitment is dependent on the prospective customer's knowledge about the particular product. There is a lack of awareness regarding Islamic banking products and it is necessary to launch awareness programs for people to adopt Islamic banks. Customer consciousness regarding Islamic banks in Nigeria has received little consideration.

Comparative benefit of Islamic banks  
The study contemplated comparative benefit in the situation of values of Islamic banking. How the Non-Muslims recognize Islamic banking will decide the outlook of Islamic banking.

Religion  
Researchers have established that Muslims value religious reasons more for the adoption of Islamic banks. Profitability is again a very important point for Islamic banking adoption apart from Religion. As the current population is of non-Muslims therefore the researchers have investigated whether religion influences the acceptance of Islamic Banking. Islamic banks must highlight the bright aspects of Islamic Banking to non-Muslim customers. More customers would be attracted to Islamic banks if it launches a useful marketing promotion. The promotion campaigns will help in growing the consciousness of Non-Muslim customers ultimately increasing the customer base ((Ezeh & Nkamnebe, 2019).  
Nigerian customers are attracted to conventional banks as they fulfill their personal needs like asset purchases, disbursement of school fees for their children, and charging high interest rates. The study recommends training Islamic banking personnel, launching marketing programs for awareness among the masses, and starting products that offer loans to consumers to meet their necessities. (Dabor & Aggreh, 2018)

<table>
<thead>
<tr>
<th>Prospects of Islamic Banking</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of Awareness(^1)</td>
<td>Awareness Programs</td>
</tr>
<tr>
<td>Need of Muslims living overseas(^2)</td>
<td>Expand branches to other countries</td>
</tr>
<tr>
<td>Utilize the OIC Market (^3)</td>
<td>Expand in OIC countries</td>
</tr>
<tr>
<td>Agriculture and Underprivileged areas(^4)</td>
<td>Finance agriculture and underprivileged areas</td>
</tr>
<tr>
<td>Social and Monetary problems(^5)</td>
<td>Awareness that IB will ease this problem</td>
</tr>
</tbody>
</table>

References:

Challenges facing Islamic Banking  
Islamic banks face challenges in western countries due to their regulatory setup which supports traditional banks and not Islamic banks. In some Muslim countries, the Government is not very cooperative in establishing Islamic Banks. (Ahmed, 2008; Meisamy & Gholipour, 2020). The Shariah supervisory board in Islamic banks is not performing according to shariah standards as these Islamic banks are not contributing to poverty alleviation. In other Muslim countries, the Shariah supervisory board does not exist at all. (Majeed & Zainab, 2017; Meisamy & Gholipour, 2020; Yanıkkaya & Pabuççu, 2017). Most of the Islamic Banking transactions are focused on Murabaha instead of PLS-based products. The main theme behind Islamic banking is that it encourages PLS-based funding but in actual the balance sheet of Islamic Banking is filled with Murabaha and Ijara based financing. The participatory form of financing is possible only when there is a true Islamic state where every institution approves and works for the achievement of
common goals and objectives. If the PLS-based financing is to be promoted then it is necessary to bring improvements in the system otherwise non-participatory forms of financing will dominate Islamic banking. (Miah & Suzuki, 2020; Nouman et al., 2018). Islamic banking products are costlier when compared to traditional banks. The average cost of financing is more when compared with traditional banks. Islamic finance is associated with distinctive risks and costs, therefore, requiring the bank to maintain more funds to cover the risks hence making the finance more expensive.

The Islamic banking system was not allowed to operationalize as the government deemed it cannot operate in India. Again in 2014 Shariah mutual fund launched was stopped by the Government as one of the ministers shared his concern that Islamic banking will be destructive for the Indian economy. The minister also said that it might lead to the transfer of doubtful funds to India through Islamic Banks (Charles, 2021).

The author further suggests the following points for the promotion of Islamic Banking in India.

1.) Awareness seminars for increasing the knowledge level of people
2.) Make people aware that Islamic banking will help alleviate social and fiscal problems
3.) Islamic banking offers a window of opportunity for needy people not provided by traditional banks
4.) Islamic banks must provide exceptional customer services when with conventional banks so the acquisition and maintenance of new customers is easy

The financing principles of Islam do not allow interest and include a large number of people and companies in the financial system. Islamic ideology says that the entire fortune belongs to Allah and man/ woman is only the guardian of it. The research suggests that the commencement of Islamic finance in India will generate more financial additions. The study demonstrates that IFS (Islamic Financial System) is selected by individuals who have low income, not a very good occupation. Consequently, the IFS should be promoted in India to generate more financial insertion (T. Ahmad et al., 2021). Wasrsam (2009) defines financial addition as ‘the proportion of residents or persons and companies using the monetary services”. According to the world bank (2013), monetary additional can considerably add to poverty reduction and increase the rate of occupation and affluence.

The conduct of Islamic banks is determined by calculable measures towards the development of a wide-ranging financial system. The outcome of the investigation shows that there is a difference between claim and reality. Islamic banks are more focused on the commercial area and privileged class individuals and charging high financing costs. There might be a need for finance for the establishment of small businesses, health and education purposes but Islamic banks do not have anything to offer from their available product schemes. Islamic banks are mostly operating in big urban centers and Islamic banking products are costlier than conventional banking products (Shaikh, 2018). The paper suggests that for rapid growth Islamic banks should take the following steps:

1.) Concentrate on developing branch networks in rural areas
2.) More importance should be given to agriculture, small and medium enterprises
3.) The bank must also offer inexpensive financial products for quicker adoption among the masses

Meisamy & Gholipour, (2020) investigate the threats that are faced by Islamic banking in Iran. The main challenges are listed below:

1.) The Executive approach to Islamic Banking
2.) Absence of rivalry
3.) Not reviewing the law (RFBA)
4.) Absence of Shariah guidance
5.) Absence of bookkeeping and verification code

On Bank productivity, some find Islamic banks are well-organized than traditional banks whereas
others do not find any variations between these two banks. Second small Islamic banks are more established and can lessen the risk well. Third Islamic banks are backed by excellent assets and the chances of fiasco are lesser as compared to commercial banks. Fourth, Islamic banks are more prone to aid SMEs (Narayan & Phan, 2019)

Investigation on moral problems reveals these important points. 1.) Moral problems and CSR objectives are not followed by many Islamic financial institutions. 2.) There is varied proof of the association between ethical issues of bank/ organizational conduct. This area of Islamic finance needs more research to come to some agreement.

Certain challenges were identified in the (Narayanan & Phan, 2019) study. These are 1.) Islamic finance should be considered as a distinct entity and separate studies should be conducted on it. This is will develop the field of Islamic finance. Most research on Islamic finance is conducted in a comparative sense with traditional finance. 2.) The availability of superior and rare data related to Islamic finance is very important. It will help in solving exclusive Islamic finance-related study queries. 3.) The focus should be on researching comparatively less investigated topics like asset valuing, and bond marketplaces. With the availability of new data research on these topics will be done more easily. 4.) Absence of research on commercial finance linked subjects in Islamic finance. There is a dearth of knowledge on such topics as the basis of capital organization, swiftness of change to force, and the factors which decide leverage. 5.) Determining the vigor of the experimental finds is also an obstacle. The researcher believes that the trend of empirical research is continuing and with time new techniques will appear which will provide main findings and inferences with little hesitation.

<table>
<thead>
<tr>
<th>Islamic Banking Challenges worldwide: Key Takeaways</th>
</tr>
</thead>
<tbody>
<tr>
<td>Challenges</td>
</tr>
<tr>
<td>Lack of co-operation by non-Muslim Governments¹</td>
</tr>
<tr>
<td>Shariah Supervisory Board not up to mark²</td>
</tr>
<tr>
<td>More focus on Murabaha contract³</td>
</tr>
<tr>
<td>Islamic banks more expensive⁴</td>
</tr>
</tbody>
</table>

References:

Islamic Banking Criticism
The basic foundation of Islamic banking is on the Profit and Loss sharing system. This system is not being followed by Islamic banks (Chong & Liu, 2009; T. Khan, 2018; Majeed & Zainab, 2017). Islamic banking is more focused on the non-participatory form of financings like Murabaha and Ijara (Dar & Presley, 2000; F. Khan, 2010; Nouman et al., 2018) however Islam focuses more on the participatory form of financing like the Modarba and Musharika. Another criticism of Islamic banking is that the products are debt-based (Ali & Hussain, 2016; Azmat et al., 2015; Miah & Suzuki, 2020). Islamic banks must introduce profit and loss sharing products to overcome this criticism. Islamic banks are not influencing the less privileged sector of society (Alkhan & Hassan, 2021; Hamidi et al., 2019; Shaikh, 2018). Islamic banks must cater to the less privileged sector by introducing CSR, and providing loans to the less privileged section of society. Many of the scholars do not have a consensus on the shariah compliance of Islamic banking products (Ahmad & Imran, 2021; Butt et al., 2011; Saputro et al., 2018). Islamic banks must try and bring out products that are more Shariah-compliant and have the consensus of all
religious scholars. Another criticism of Islamic banking is that it is considered as just equivalent to conventional banks and people think of it as just name change and regard it as being un-Islamic (Majeed & Zainab, 2018; Saputro et al., 2018; Shabbir & Rahman, 2019). The Islamic banks must launch an awareness campaign among the masses to correct this misconception and make people aware of what steps Islamic Banks are taking to practically implement Islamic banking in society.

Scholars' opinion is divided on the Islamic banking role of achieving societal goals. Few think that Islamic banks are business enterprises and should be allowed to function freely if they are complying with Shariah laws. On the contrary, many scholars think that the Islamic bank's purpose is to back and inspire a fiscal system that helps in the creation of an unprejudiced, impartial and stable society. Another author (Al-Zuhayli, 2003, p.250) indicated “the chief objective of Islamic Bank is not earning profit but the authorization of social objectives of socio-economic growth and reduction of underdevelopment.”

The outcome of the research specifies that the societal consequences of Islamic Banking are truncated. Research participants view Islamic banks as not doing enough to meet their social responsibility. Secondly, participants agree with the view of merging CSR and the ZIS-Waqf system (52.9%) or expanding the capacity of CSR (25.1%). Thirdly the combination of the ZIS-Waqf system might be possible hypothetically but is not possible practically as many lawful issues may arise. Participants think that ISB must operate in areas of less privileged people so they can benefit from it. The ISB must develop a transparent system to monitor the financing of both lucrative and virtuous projects. ISB's priority should be to support SME’s and the farming sector.

Islamic Banking has been widely criticized for not following Shariah rules. Islamic Banks have become very popular worldwide in both Muslim and Non-Muslim countries. The value of assets of Islamic banks stood at US $ 2TN in 2015 and the number of Islamic banks is more than 775. Pakistan is also among the countries which are struggling hard to support Islamic banks. There has been a rapid growth in the number of Islamic banks in Pakistan from 150 in 2007 to 2146 in 2016. (Majeed & Zainab, 2018)

<table>
<thead>
<tr>
<th>Islamic Banking Criticism: Key Takeaways</th>
</tr>
</thead>
<tbody>
<tr>
<td>Criticism</td>
</tr>
<tr>
<td>PLS system not implemented⁷</td>
</tr>
<tr>
<td>Non-participatory form of financing⁸</td>
</tr>
<tr>
<td>Debt-based products⁹</td>
</tr>
<tr>
<td>No impact on less privileged people⁴</td>
</tr>
<tr>
<td>Products are not Shariah compliant⁶</td>
</tr>
<tr>
<td>Islamic Banking being considered un-Islamic⁶</td>
</tr>
</tbody>
</table>

References

Conclusion
The findings of the systematic review suggest the following things:
People have not been able to distinguish between Islamic Banks and commercial banks because Islamic banks have not been able to highlight their social objectives from their operation and function. Future research in this area would suggest a framework where the social objectives of Islamic Banking are highlighted and a clear differentiation is made between commercial and Islamic banks. The religious scholars had proposed a framework for Islamic banks where social objectives were also highlighted before the launch of Islamic Banks.

Gap Identification and Future Research
1.) The social responsibility of Islamic banking is an area that has not been researched. It is recommended that this area should be covered highlighting the achievements or shortcomings of Islamic Banks in this area.
2.) Islamic bank's responsibility is to promote equal opportunity for everyone in society. People who do not have capital but a good idea can be supported by Islamic banks on Profit and loss sharing system. Future research should be done on how Islamic banks have contributed in this area and how it can be executed for the betterment of society.
3.) Islamic banks can help reduce poverty. This is an area that needs to be investigated and can highlight Islamic banks existing contribution whereas its plans for how to achieve it need to be highlighted.
4.) Future research can study the circumstances that can promote Musharika and Mudarba financing in Islamic Banks.
5.) Future studies can also concentrate on what mediums should be adopted to make people aware of Islamic banks.
6.) Future research can also study how the Shariah Advisory Board helps in the functioning of the Islamic Bank. It will help masses and practitioners understand the importance of the Shariah Advisory board in the functioning of Islamic banks.
7.) Future research can also concentrate on the points which can bring a consensus among all Shariah scholars regarding the acceptability of Islamic banking products as per Shariah guidelines.

References


Impact of Monetary Policy on Inflation and Investment in Pakistan: A Time Series Analysis

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Purpose: This study aims to explore the impact of monetary policy on inflation and investment in Pakistan.

Methodology: Our study employs the Autoregressive distributed lag model (ARDL) over the time of 1972 to 2019.

Findings: The empirical findings show that in the long-run impact of money supply has significant and positive on investment and other variables trade, foreign direct investment, gross domestic saving, services are also positively associated with the investment. While other variables interest rate and exchange rate negatively linked with investment. Empirical findings of the second econometric model show the core variable money supply has a significant and positive on inflation including other variables foreign direct investment, exchange rate, exports and government expenditures on education but other variables interest rate, gross domestic saving and agriculture output negatively linked with inflation.

Implications: The study indicates that a stable monetary policy should be introduced to improve a country's economic development. Monetary policy should be used to build an agreeable environment of uncertainty that draws both domestic and outside investors to promote economic growth. Economic growth can be accomplished by encouraging efficient monetary policy steps for inflation stability and attractive interest rates.

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Introduction
The principal concerns of any economy are monetary policy, inflation and investment. Monetary stability and financial markets are closely linked. Capital markets and banking intermediation are the networks by which monetary policy operates and interacts with inflation, exchange rates, and economic development (Muhammad et al. 2013; Amassoma et al. 2018). The normal and systematic financial structure is also a requirement for a stable economy. Financial agents play a key role in an effective financial system, which is necessary to ensure that creditors and borrowers systematically authorize and operate their resources. Capital markets leverage surplus savings units (Lender) and streamline them across a wide range of financial strategies, tools, and institutions into the hands of deficit units (Adenuga & Olatunde 2020). The monetary policy applies to the country's central bank's credit management actions. The primary goal of monetary policy is market stability. Price stability maintains a stable value of money, eliminates cyclical changes, contributes to economic stability, reduces income inequalities, and encourages economic welfare. A counter-cyclical monetary policy that is easy during a recession and dear (strengthening) monetary policy during inflation can maintain price stability (Fitzgerald 1991; Freetown 2009; Simwaka et al. 2011; Mbongo et al. 2014; Adenuga & Olatunde, 2020). Monetarists charge the Central Bank to be the causative agent of inflation. They relate inflation to monetary aggregates, which are under the control of the Central Bank. The Central Bank, through its effective policy, can bring down and maintain the required inflation level. The primary measure to be adopted by the Central Bank is its strict monetary policy, which will increase the interest rate of the commercial banks, thus making borrowing expensive and decreasing national income. This decrease in the national income will effectively bring down the price level. So, by strict or flexible quantitative tools, the Central Bank can influence the money supply in an economy (Okpara&Nwaoha2010; Nguyen 2015).

Structuralists are the proponents of various complementary measures which may either increase the aggregate supply or decrease aggregate supply. These preliminary steps include an increase in industrial and agricultural output, exploitation of mineral resources, population and price control, maintenance of healthy proportion between the wages and productivity and change in the lifestyle of the citizens. Agricultural and industrial output will enhance aggregate supply, effectively meeting aggregate demand, reducing the price level. Mineral resources are the natural, God-gifted assets of a nation. These available resources, if utilized, will increase productivity and decrease inflation. So, the Structuralist Approach to inflation emphasizes properly utilizing the overall available economic potential (Ahiabor 2013; Adenuga & Olatunde 2020). All major schools of thought give an alternative and practically applicable solution to inflation. If all of these theories are applied with proper proportion and coordination to one another, the issue of inflation can be addressed. The very idea emphasizes the need for all responsible state organs to work accordingly while fulfilling their duties at their best (Grauwa and Polon2005; Nguyen 2015).

As specified in the State Bank of Pakistan (SBP) Act of 1956, Pakistan's monetary policy aims to achieve the Government's annual inflation and development goals. The State Bank of Pakistan (SBP) was responsible for the management of the monetary policy. The State Bank of Pakistan seeks monetary aggregates in line with the government’s real GDP development and inflation goals to achieve monetary policy objectives. Some financial market reforms have been introduced to modernize the monetary sector with international financial institutions such as the International Monetary Fund (IMF) or World Bank. As a result of this free market activity, Pakistan's monetary policy has become a significant instrument. In the 1990s, Pakistan adopted a liberal and market-oriented monetary policy by changing the discount rate and cash reserve requirements. This included a move towards indirect monetary policy instruments and a substantial gap between direct measures, such as liquidity reserve rates, credit caps and controls. These steps have enhanced the transparency and implementation of policy signals(Chaudhary & Ahmed 1995; Abbas and Hussain 2000).

Investment is defined as the creation of capital or net add-on to capital stocks. Gross fixed capital
formation usually measures investment. The Central Statistical Organization explains gross fixed capital build-up and inventory change as the sum. In the annual fixed capital, the gross value of the goods is defined as the gross fixed capital formation. The difference between stock market value at the beginning and end of the period is defined as stock change. Therefore, many studies measured private investment in gross fixed capital formation (Bader & Malawi 2006; Wuhan et al. 2015). Then there are the main types of investment, government investment, private investment and direct foreign investment. In the macroeconomic context, purchasing a capital asset intended to generate income or increase its value or to generate income and raise its value is defined as private investment. A financial intermediary is simply the property generally purchased for the investor to generate revenue; private investment is expected to be positively linked to economic growth (Grimsley, 2013). Economic investment, in plain terms, implies non-governmental investment. Private investment is classified into three primary categories: residential, non-residential or fixed investment, and inventory. The purchase applies to purchasing new houses where people buy and property owners buy new homes for sale. Company fixed expenditure is the procurement by the businessmen for the manufacture of new machinery and facilities. Investment in current assets consists of an improvement in the inventory of unsold or unwanted items. Investment of this type is very different from fixed investment since inventory capital usually has a very short lifespan. Inventory expenditures are unfavourable if inventories decline from one cycle to the next, often at a complete amount. The inventory expenditure is often special in that it sometimes happens accidentally. Unsold goods are called an investment in inventory, whether the retailer has acquired them to grow their inventory or just sold less than anticipated (Li, 2021). The main objective of the present study is to analyze the impact of monetary policy on the inflation rate and investment in Pakistan. The study employs an autoregressive distributed model (ARDL) over the period 1972-2019. The remaining section of the paper is structured as follows: the next section is about the literature review. The third section is about data and econometric methodology. The fourth section denotes results and discussion. Finally, the last section is about concluding remarks and policy suggestions.

**Literature review**

Obinna (2020) analyzed the impact of interest rates on investment in Nigeria. This research employed vector autoregressive econometric techniques to correct errors and decomposition variances and found no significant impact of interest rate on investment in Nigeria. The analysis suggested that the government use its monetary policy to control interest rates in the Central Bank of Nigeria to promote investment growth in the region, rather than enabling it to be freely dictated by market forces, as the liberalization theory implies. Adenuga & Olatunde (2020) examined the effect of interest rates on investment in Nigeria. The conclusion of the analysis showed mixed results since the first lag time of any of the three indices suggested that the growth of investments was positive. In contrast, the second lag showed that investment had negative consequences. Mujahid et al. (2019) investigated the link between inflation, rate of interest and investment to incorporate a new dimension of call money rate that may enhance the investment opportunities in Pakistan. The findings indicated that the call money rate and inflation have a significant effect on investment and thus on economic growth. Amassoma et al. (2018) investigated the impact of money supply on inflation in Nigeria. The study finds that money supplies may not significantly affect inflation in the long or short term due to the recession in this region. Wuhan et al. (2015) studied the role of interest rate on investment in Jiangsu province of China from 2003-to 2012. The findings of this study show a negative association in the long run while positive in the short run.

Nguyen (2015) investigated the influence of fiscal deficit and broad money M2 supply on inflation in 1985-2012 for selected Asian countries. The analysis reveals that the M2 broad money supply has a substantial positive effect on inflation only with the Pooled Mean Group calculation. Mbongo et al. (2014) examined the influence of money supply on inflation in...
Tanzania. The findings of the ordinary least square and error correction model demonstrated a significant effect on inflation in both short and longer-term money supply and exchange rate. Furthermore, vector autoregressive results have shown that present inflation can be affected by previous state inflation. Muhammad et al. (2013) analyzed the impact of interest rates on investment to the extent of Pakistan. This analysis indicates that Pakistan is relatively beneficial to the major determinants of real interest rates and wages. The interest rate should remain regulated to draw investment in Pakistan’s institutions. Ahiabor (2013) looked at the influence of monetary policy on inflation in Ghana. The study found that the relationship between money supply and inflation had been long-term positive, but the negative association between interest rate and inflation had been positive. Malawi (2012) analyzed the impact of interest rates on investment in Jordan. This analysis revealed that the actual interest rate hurts investment, but the level of income has a positive impact. These results indicate that the effect on investment of the real interest rate is larger than that of income in Jordan’s economy. Okpara & Nwoh (2010) analyzed the association among money supply, price, Government expenditure and output in Nigeria. The research has shown that the long-term relationship between indigenous variables is much greater than the short-term relationship. The article reveals that the increase of money supply for inflation and real Gross Domestic Product was highly significant. The study found that the price level was rising due to some boom in the money supply.

Freetown (2009) analyzed the growth of money supply and macroeconomic convergences in the Economic Community of West African States. The analysis reveals that, in all the Economic communities of Western African states, the increase in limited money supply was higher than the rate of growth of the GDP. This study showed that in most countries, the speed of money declined during the time observed. Freetown (2009) analyzed the growth of money supply and macroeconomic convergences in the Economic Community of West African States. This study showed that in most countries, the speed of money declined during the time observed. Qayyum (2008) investigated the effective role of monetary policy on the inflation rate in Pakistan. The outcome of this study was that all efforts of the State Bank of Pakistan failed in controlling the supply of money and rate of inflation. The study suggested that to strengthen the control over the inflation rate, it was necessary to have a strong grip on the supply of money growth. Bader & Malawi (2006) analyzed the impact of interest rates on investment in Jordan. This analysis revealed that the actual interest rate hurts investment, but the level of income has a positive impact. These results indicate that the impact on investment of the real interest rate is larger than that of income in Jordan’s economy. Qayyum (2006) analyzed the relationship between surplus money supply and inflation rate for the Pakistan economy and confirmed the Monetarist’s views that everywhere inflation is a monetary phenomenon. Khan & Schimmelpfennig (2006) researched the main reasons for Pakistan’s inflation rate. The findings of this study were that monetary factors are caused by inflation in Pakistan. This study presented money supply growth (M2 broad money) and growth in private sector credit as main variables that caused a rise in inflation rate with a lag of almost one year (12 months).

Brumm (2005) investigated the association between money stock, output and inflation. The findings showed that the relationship between the stock of money and inflation was positive and negative among inflation and aggregate output. Abdulrazag et al. (2003) examined empirical investigation on the supply of money in Qatar. The analysis indicated a favorable association between the rise of the money supply and inflationary rates in the long term. It also indicates that
public spending has a major effect on the pace of growth of the money supply in the short term. Moroney (2002) discussed the quantity theory of money growth, inflation rate and GDP in the long run. The study concluded that the relationship between the M2 growth rate and the inflation rate in counties with high money supply growth rates was powerful, positive and one to one. Christensen (2001) examined the effect of real money supply shocks on monetary policy. The findings revealed that the growth rate of money supplies and inflation is largely dependent on the actual supply shocks across the world in the short term. The effects of Oil inflation and real-world productivity on monetary growth are significant. This study has shown that the inflation rate and monetary supply in the observed United States have remarkably strong coordination.

Data and Methodology
The study uses different models to attain our objectives. In these two models, investment and inflation are dependent variables. While money supply, foreign direct investment, exchange rate, interest rate, Government expenditure on education, domestic savings, agriculture output proxied agriculture value-added, exports of goods and services, trade and services value-added are used as independent variables. The data is sourced from the World development indicators (WDI). All variables are taken in logarithmic form. For examining the impact of monetary policy on investment and inflation in Pakistan, specify the following models.

Model 1: Investment Model
The econometric equation of investment is specified as follows:

\[ 
\ln{INV}_t = \beta_0 + \beta_1 \ln{M2}_t + \beta_2 \ln{IR}_t + \beta_3 \ln{TRADE}_t + \beta_4 \ln{FDI}_t + \beta_5 \ln{EX}_t + \beta_6 \ln{SERV}_t + \beta_7 \ln{GDS}_t + \varepsilon_t 
\]  
\[(3.1)\]

Model 2: Inflation Model

\[ 
\ln{INFL}_t = \beta_0 + \beta_1 \ln{M2}_t + \beta_2 \ln{IR}_t + \beta_3 \ln{EX}_t + \beta_4 \ln{FDI}_t + \beta_5 \ln{EXP}_t + \beta_6 \ln{AGRI}_t + \beta_7 \ln{GEE}_t + \beta_8 \ln{GDS}_t + \varepsilon_t 
\]  
\[(3.2)\]

Where:
- INV = Investment
- INFL = Inflation
- EX = Exchange rate
- FDI = Foreign direct investment
- IR = Interest rate
- GEE = Government expenditure on education
- GDS = Gross domestic savings
- AGRI = Agriculture value added
- Exp = Exports of goods and services
- M2 = Money Supply
- TRADE = Trade
- SERV = Services value added

In this section, the methods and the tests used to approximate the described models are explained. First, unit root tests are used to verify the variables’ stationarity. The second is that ARDL is formulated including with F-bound co-integration test.

The Unrestricted Error Correction Model for Pakistan is based on equation and follows:

\[ 
\Delta (INV)_t = \alpha + \beta_1 (INV)_{t-1} + \beta_2 (M2)_{t-1} + \beta_3 (IR)_{t-1} + \beta_4 (TRADE)_{t-1} + \beta_5 (FDI)_{t-1} + \beta_6 (EX)_{t-1} + \beta_7 (GEE)_{t-1} + \beta_8 (GDS)_{t-1} + \sum \lambda_i \Delta (INV)_{t-i} + \sum \lambda_2 \Delta (M2)_{t-i} + \sum \lambda_3 \Delta (IR)_{t-i} + \sum \lambda_4 \Delta (TRADE)_{t-i} + \sum \lambda_5 \Delta (FDI)_{t-i} + \sum \lambda_6 \Delta (EX)_{t-i} + \sum \lambda_7 \Delta (SERV)_{t-i} + \sum \lambda_8 \Delta (GDS)_{t-i} + \varepsilon_t 
\]  
\[(3.3)\]

Where \( \beta_i \) represents long run multiplier and \( \lambda \) is for short run coefficient of ARDL, \( \varepsilon \) represents error term and first difference is operated by \( \Delta \).
Likewise, unrestricted error correction model for model 2 is written as:

\[
\Delta (INFL)_t = \alpha + \beta_0(INFL)_{t-1} + \beta_2(M2)_{t-1} + \beta_3(IR)_{t-1} + \beta_4(EX)_{t-1} + \beta_5(FDI)_{t-1} + \beta_6(EXP)_{t-1} + \beta_7(AGRI)_{t-1} + \beta_8(GEE)_{t-1} + \beta_9(GDS)_{t-1} + \sum \lambda_1 \Delta (INFL)_{t-i} + \sum \lambda_2 \Delta (M2)_{t-i} + \sum \lambda_3 \Delta (IR)_{t-i} + \sum \lambda_4 \Delta (EX)_{t-i} + \sum \lambda_5 \Delta (FDI)_{t-i} + \sum \lambda_6 \Delta (EXP)_{t-i} + \sum \lambda_7 \Delta (AGRI)_{t-i} + \sum \lambda_8 \Delta (GEE)_{t-i} + \sum \lambda_9 \Delta (GDS)_{t-i} + \epsilon_t
\] (3.4)

Where \( \lambda \) and \( \beta_i \) show short run and long run parameters of ARDL & \( \epsilon_t \) show error term and \( \Delta \) show first difference.

Our next step after applying the ARDL equation is to use ARDL bound tests for the co-integration of variables. The existence of a long-term relationship between variables must be tested before the long-term coefficient and error correction models are evaluated. To determine the presence of ARDL cointegration tests, use F statistics or (Wald test) using an OLS method for the dual importance of the lagging variables \((i = 0 1 2 3 4)....n\)

Null hypothesis and Alternative hypothesis can be written as

\[
\begin{align*}
H_0 &= 0 \quad \text{(existence of no cointegration)} \\
H_1 &\neq 0 \quad \text{(existence of cointegration)}
\end{align*}
\]

The hypothesis of null shows that the coefficients used in this equation are equal to zero and that no co-integration or long-term relationship is not present. Alternative hypotheses likewise expose the probability of co-integration or long-term relationships that, if at least one of the lagged parameters is not equal to zero. To investigate the null hypothesis against the alternative hypothesis, statistics of the F test is used. A no-cointegration hypothesis or a long-range relation between the findings was dismissed when the estimated F value is more significant than those with a critical upper bound value. If the F-value is smaller than that of a lower critical value than that of dismissal and accepts null hypotheses, there are no co-integration or a long-term relationship in that case. If the "F" value is between the lower bound critical values and the upper bound values, the test is not concluded for the given stage. The autoregressive distributed lag model is suitable in the case of mixed order of integration. The given methodology has advantages over traditional ones like it is suitable in the case of a small sample; giving the short run and long run results at the same time; using the lag value of the dependent variable and finally, error correction term in ARDL gives surety of long-run adjustment.

Results and Discussion

Descriptive and Correlation

The descriptive and correlation analysis are shown in the following tables 4.1 and 4.2. Table 4.1 the average value of gross fixed capital formation, gross domestic savings, exchange rate, foreign direct investment, interest rate, trade openness, money supply, and services value-added are 31.02, 30.65, 3.48, 27.16, 2.41, 31.72, 27.48, 32.11 respectively. While the maximum/minimum values of gross fixed capital formation, gross domestic savings, exchange rate, foreign direct investment, interest rate, trade openness, money supply and services value-added are 33.93 /32.11, 30.74 /27.49, 35.25 /28.37 respectively. Table 4.1 also show the correlation analysis of all variables which are used in the investment model.

| Table 4.1: Descriptive and Correlation Analysis of Investment Model |
|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| GFCF  | GDS  | EX   | FDI  | IR   | TRADE | M2   | SERV            |
| Mean  | 31.02 | 30.65 | 3.48 | 27.16 | 2.41  | 31.72 | 27.48 | 32.11          |
| Median| 31.16 | 31.04 | 3.52 | 28.25 | 2.42  | 31.94 | 27.52 | 32.13          |
| Maximum| 33.93 | 33.17 | 5.01 | 31.16 | 2.74  | 34.68 | 30.74 | 35.25          |
According to table 4.2, the average value of inflation gross domestic product deflator, exchange rate, foreign direct investment, interest rate, government education expenditure, gross domestic savings, agriculture value-added, exports and money supply are 2.07, 3.48, 27.16, 2.41, 29.14, 30.65, 31.49, 30.82, and 27.48 respectively. While the maximum and minimum values of inflation gross domestic product deflator, exchange rate, foreign direct investment, interest rate, government education expenditure, gross domestic savings, agriculture value-added, exports and money supply are 3.65 and -0.92, 5.01 and 2.16, 31.16 and 1.00, 2.74 and 1.78, 32.44 and 25.18, 33.17 and 27.25, 33.58 and 26.70, 30.74 and 24.05, respectively.

**Table 4.2: Descriptive Statistics of Key Variables of Inflation Model for Pakistan**

<table>
<thead>
<tr>
<th></th>
<th>INFL</th>
<th>EX</th>
<th>FDI</th>
<th>IR</th>
<th>GEE</th>
<th>GDS</th>
<th>AGRI</th>
<th>EXP</th>
<th>M2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum</td>
<td>27.25</td>
<td>27.25</td>
<td>2.16</td>
<td>1.00</td>
<td>1.78</td>
<td>27.49</td>
<td>24.05</td>
<td>28.37</td>
<td></td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>1.92</td>
<td>1.95</td>
<td>0.89</td>
<td>4.66</td>
<td>0.22</td>
<td>1.95</td>
<td>2.04</td>
<td>2.04</td>
<td></td>
</tr>
<tr>
<td>Skewness</td>
<td>-0.20</td>
<td>-0.35</td>
<td>-0.05</td>
<td>-3.77</td>
<td>-0.96</td>
<td>-0.22</td>
<td>-0.02</td>
<td>-0.09</td>
<td></td>
</tr>
<tr>
<td>Kurtosis</td>
<td>1.96</td>
<td>1.68</td>
<td>1.58</td>
<td>21.82</td>
<td>3.59</td>
<td>1.99</td>
<td>1.79</td>
<td>1.80</td>
<td></td>
</tr>
<tr>
<td>Jarque-Bera</td>
<td>2.51</td>
<td>4.43</td>
<td>4.06</td>
<td>821.77</td>
<td>8.11</td>
<td>2.41</td>
<td>2.91</td>
<td>2.93</td>
<td></td>
</tr>
<tr>
<td>Probability</td>
<td>0.29</td>
<td>0.11</td>
<td>0.13</td>
<td>0.00</td>
<td>0.02</td>
<td>0.30</td>
<td>0.23</td>
<td>0.23</td>
<td></td>
</tr>
<tr>
<td>observations</td>
<td>48</td>
<td>48</td>
<td>48</td>
<td>48</td>
<td>48</td>
<td>48</td>
<td>48</td>
<td>48</td>
<td></td>
</tr>
</tbody>
</table>

**Unit Root Test Analysis**

Here we establish some unknown and basic informal rules to determine if the order is I (0), indicating that there are stationary variables or I (1) representing the variable is stationary at the first difference. Analyze data either is stationary or non-stationary unit root test is used.

**Table 4.3: Results of unit root test**

<table>
<thead>
<tr>
<th>Augmented Dickey-Fuller Test</th>
<th>INFL</th>
<th>EX</th>
<th>FDI</th>
<th>IR</th>
<th>GEE</th>
<th>GDS</th>
<th>AGRI</th>
<th>EXP</th>
<th>M2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>-0.28</td>
<td>0.69</td>
<td>1</td>
<td>-0.16</td>
<td>-0.06</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>-0.25</td>
<td>0.98</td>
<td>0.74</td>
<td>-0.15</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>-0.32</td>
<td>0.98</td>
<td>0.73</td>
<td>-0.12</td>
<td>0.982</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>-0.31</td>
<td>0.99</td>
<td>0.72</td>
<td>-0.16</td>
<td>0.995</td>
<td>0.98</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>-0.27</td>
<td>0.99</td>
<td>0.73</td>
<td>-0.11</td>
<td>0.993</td>
<td>0.99</td>
<td>0.992</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-0.32</td>
<td>0.99</td>
<td>0.72</td>
<td>-0.17</td>
<td>0.997</td>
<td>0.98</td>
<td>0.998</td>
<td>0.99</td>
</tr>
</tbody>
</table>
Table 4.3 shows mixed results of the unit roots for data stationarity. So we are applying these mixed results autoregressive distributed lag econometric technique to estimate co-integration and long-run analysis.

**Bound Test Results**

Bound testing is developed to see the long-term relation using F-statistics. Maximum two lag orders (Pesaran and Shin 1999) should be used for ARDL estimates. F-statistics is explicitly used in the Wald test, where coefficients of long-term variables are reduced. The F-statistics measured value is compared with the table values. F statistics' table value has two critical limits, upper I (1) and lowers bound I (0). A long-run relationship between variables is present if the F-statistic estimated value is greater than the upper bound. If the F-statistic measure is less than the lower value, a long-term relationship between the variables would not be detected. If the value persists among two bounds, the findings are inconclusive.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Level</th>
<th>1st Difference</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Intercept</td>
<td>Intercept + Trend</td>
<td>Intercept</td>
</tr>
<tr>
<td>INFL</td>
<td>-4.517588</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>(0.0007)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GFCF</td>
<td>-2.6848</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>(0.0842)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exp</td>
<td>-2.841767</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>(0.0602)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TRADE</td>
<td>-3.327801</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>(0.0191)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EX</td>
<td>0.569868</td>
<td>-3.219428</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>(0.9874)</td>
<td>(0.0934)</td>
<td></td>
</tr>
<tr>
<td>FDI</td>
<td>-2.034456</td>
<td>-3.075324</td>
<td>-8.607545</td>
</tr>
<tr>
<td></td>
<td>(0.2716)</td>
<td>(0.1245)</td>
<td>(0.0000)</td>
</tr>
<tr>
<td>IR</td>
<td>-1.815042</td>
<td>-1.870374</td>
<td>-4.507126</td>
</tr>
<tr>
<td></td>
<td>(0.3688)</td>
<td>(0.6535)</td>
<td>(0.0007)</td>
</tr>
<tr>
<td>GEE</td>
<td>-2.344865</td>
<td>-2.615766</td>
<td>-6.375007</td>
</tr>
<tr>
<td></td>
<td>(0.1627)</td>
<td>(0.2755)</td>
<td>(0.0000)</td>
</tr>
<tr>
<td>GDS</td>
<td>-1.610422</td>
<td>-0.911768</td>
<td>-7.579248</td>
</tr>
<tr>
<td></td>
<td>(0.4694)</td>
<td>(0.946)</td>
<td>(0.0000)</td>
</tr>
<tr>
<td>AGRI</td>
<td>-1.529883</td>
<td>-2.321671</td>
<td>-6.538073</td>
</tr>
<tr>
<td></td>
<td>(0.5099)</td>
<td>(0.4144)</td>
<td>(0.0000)</td>
</tr>
<tr>
<td>M2</td>
<td>-0.7968</td>
<td>-2.9081</td>
<td>-5.4423</td>
</tr>
<tr>
<td></td>
<td>(0.8107)</td>
<td>(0.1695)</td>
<td>(0.0000)</td>
</tr>
<tr>
<td>SERV</td>
<td>-1.061051</td>
<td>-2.293141</td>
<td>-5.885577</td>
</tr>
<tr>
<td></td>
<td>(0.7234)</td>
<td>(0.4292)</td>
<td>(0.0000)</td>
</tr>
</tbody>
</table>

Table 4.4: Results of Test for Co-integration

<table>
<thead>
<tr>
<th>Country</th>
<th>Model</th>
<th>F-statistic</th>
<th>Significance at 5%</th>
<th>Significance at 10%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>I(0) Bound</td>
<td>I(1) Bound</td>
</tr>
<tr>
<td>Pakistan</td>
<td>1</td>
<td>3.523159</td>
<td>2.32</td>
<td>3.5</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>7.982074</td>
<td>2.22</td>
<td>3.39</td>
</tr>
</tbody>
</table>

Source: Author's calculation

The estimated F-statistic value for the inflation model is 7.982074, 5 to 10 percent higher than the upper bound. Thus we reject the null hypothesis for the Inflation model and the long-run relationship exists. Both these observations suggest that no co-integration theory is dismissed. Long-run relationships exist in all the models of Investment and Inflation for Pakistan.

4.4 Long-run results (Investment Model)
In this section, we have discussed the estimate of the long-run relationship by autoregressive lag model and interpreted the outcomes of long-run coefficients of investment model for Pakistan. All these outcomes of long-run effects show in the following tables. We have specified these variables for the Investment model; gross fixed capital formation is the dependent variable and money supply, interest rate, trade openness, foreign direct investment, exchange rate, services value-added, gross domestic savings are used as independent variables.

<table>
<thead>
<tr>
<th>Table 4.5: ARDL Long Run Estimates (Investment Model)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dependent Variable: GFCF</td>
</tr>
<tr>
<td><strong>Variable</strong></td>
</tr>
<tr>
<td>C</td>
</tr>
<tr>
<td>M2</td>
</tr>
<tr>
<td>IR</td>
</tr>
<tr>
<td>TRADE</td>
</tr>
<tr>
<td>FDI</td>
</tr>
<tr>
<td>EX</td>
</tr>
<tr>
<td>SERV</td>
</tr>
<tr>
<td>GDS</td>
</tr>
</tbody>
</table>

According to table 4.5, the coefficient of money supply shows a positive and significant impact on the dependent variable gross fixed capital formation for the investment model of Pakistan. As a result of the increased supply of money, more financing will be available for investing in the economic market. So due to this reason investment also increase. It means that a 1 percent increase in money supply leads to 0.281479 in investment with the same direction. The coefficient of interest rate shows a significant and negative effect on the investment gross fixed capital formation. Because investment is primarily funded by borrowing, the cost of capital is the primary consideration for investors to determine whether or not to pursue the chosen investment. A more costly and less efficient actual interest rate is generated, while a lower interest rate guarantees profitable and effective investment due to related cost savings. So 1 percent increase in interest rate leads to -0.060446 percent in investment with opposite direction. The coefficient of trade openness shows a positive effect on investment gross fixed capital formation. Because the openness of trade plays an important part in improving investment by boosting exports and facilitating imports of intermediate, capital goods and new technologies that motivate investments in the country. 1 percent changes in trade openness change the 0.024416 percent of gross fixed capital formation with the same direction. The evaluated coefficient of foreign direct investment shows a positive but highly significant relationship with investment gross fixed capital formation. Foreign direct investment or capital inflow guarantees the movement of funds to improve economic activities and goods and services output in domestic countries at the correct rate of trade, policies and regulation. Foreign direct investment is also encouraged through forwarding and backward connections through domestic investment and industry. It means that a 1 percent change in foreign direct investment changes the 0.028832 percent of gross fixed capital formation in the same direction.

According to table 4.5 exchange rate hurt investment gross fixed capital formation. Because when the domestic currency is appreciated, foreign resources are cheaper and thus, domestic investments are diminishing. This shows that if a 1 percent change in exchange rate changes the 0.369231 percent gross fixed capital formation in the opposite direction. The outcomes show a
positive and highly significant relationship between services value-added and investment gross fixed capital formation. Because services are directly related to investment decisions, if you have easy access to services, then you invest more. It means that a 1 percent change in services value-added will bring the 0.638044 percent change in gross fixed capital formation in the same direction. Table 4.5 shows the relationship between gross domestic savings and investment gross fixed capital formation. The relationship between gross domestic savings and investment gross fixed capital formation is positive and highly significant. Without increasing savings, investment cannot improve. Savings, therefore, play an important role in providing national investment and development capability. According to the growth models, increased investments contribute to greater accumulation of capital and thus consumption and productivity. The coefficient of gross domestic savings expects that a 1 percent change in gross domestic savings will change gross fixed capital formation by 0.154506 in the same direction. Table 4.6 shows the long-run effects of all the related variables to our study. We have specified these variables for the Inflation model. Inflation is the dependent variable and Broad money supply (M2), interest rate (IR), an exchange rate (EX), foreign direct investment (FDI), Exports (Exp), Agriculture value added (AGRI), government expenditure on education (GEE), gross domestic savings (GDS) are used as independent variables.

**Table 4.6: ARDL Long Run Estimates of Inflation Model**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>26.79976</td>
<td>10.64479</td>
<td>2.517641</td>
<td>0.0165</td>
</tr>
<tr>
<td>M2</td>
<td>0.486478</td>
<td>0.881394</td>
<td>1.851942</td>
<td>0.084</td>
</tr>
<tr>
<td>IR</td>
<td>-0.525531</td>
<td>0.357545</td>
<td>-2.469833</td>
<td>0.005</td>
</tr>
<tr>
<td>EX</td>
<td>2.025962</td>
<td>0.626886</td>
<td>3.231786</td>
<td>0.002</td>
</tr>
<tr>
<td>FDI</td>
<td>0.048245</td>
<td>0.023245</td>
<td>2.075526</td>
<td>0.045</td>
</tr>
<tr>
<td>EXP</td>
<td>1.075853</td>
<td>0.508257</td>
<td>2.116752</td>
<td>0.041</td>
</tr>
<tr>
<td>AGRI</td>
<td>-0.94241</td>
<td>0.78316</td>
<td>-1.903341</td>
<td>0.076</td>
</tr>
<tr>
<td>GEE</td>
<td>0.91401</td>
<td>0.486</td>
<td>1.880684</td>
<td>0.068</td>
</tr>
<tr>
<td>GDS</td>
<td>-0.82367</td>
<td>0.279326</td>
<td>-2.948778</td>
<td>0.005</td>
</tr>
</tbody>
</table>

According to table 4.6, the coefficient of money supply M2 is positive and statistically significant on the dependent variable inflation. According to the classic economists' macroeconomic phenomenon, increasing the supply of money contributes to higher prices in terms of quantity of theory income. As a result of the increased supply of money, more financing will be available for investing in the economic market. The investment will be made, more jobs will be produced, aggregate demand will rise, and the consumer price index will eventually increase. It shows that if the additional rise in money supply raises inflation by 0.486478 percent. The coefficient of interest rate IR has a significant and negative impact on the dependent variable. There is a general trend to create reverse correlations between interest rates and inflation. In general, the economy is rising and inflation is growing as interest rates are low. In exchange, the economy slows down and inflation declines when the interest rates are high. In economics, money quantity theory suggests that money supply and demand decide the inflation rate. As the supply of money rises, costs begin to increase. This is because any single currency unit becomes less expensive. It means the additional rise in interest rate leads to an increase in inflation by 0.525531 percent. According to table 4.6, the following variables expressed the relationship between exchange rate EX and inflation INF presented. This result shows the negative and significant relationship between exchange rate EX and inflation INF. In Pakistan, the inflation rate is affected by the exchange rate inversely and indirectly. That is because Pakistan is an agricultural nation that is
less advanced. Imports of this commodity are based on roughly inelastic products (oil products, pesticides, fertilizers, medical equipment, machinery, etc.). The negative coefficient of the exchange rate shows that the additional increase in the exchange rate declines inflation by 2.025962 percent. The evaluated coefficient of foreign direct investment shows a negative but highly significant relationship with inflation. Foreign direct investment affects the inflation rate by capital preservation in terms of internal and external factors. If an investor wants to invest in the country, he wants to invest where inflation is low and or the higher returns than the inflation rates should be to generate net profits/returns. This would cut off buyers, which will result in loss of foreign direct deposits at higher rate inflation and less correspondingly higher income. It means that additional raise in foreign direct investment decline the inflation by 0.048245 percent.

The table shows the positive impact on inflation of exports. Because when the exchange rate will high, then exports increase. Due to this increase in exports domestic market face a shortage so, inflation increase. This shows that an additional increase in exports raises inflation by 1.075853 percent. The result shows a negative and significant relationship between agriculture value-added and inflation. Since people's wages and buying power are diminished as inflation rises concerning the agriculture sector, they can't attain sound agricultural output due to high expenses. It means that an additional raise in agriculture value-added decline the inflation - 0.94241 percent. Table 4.6 shows the negative and significant impact of gross education expenditure on inflation. Education is also positively connected to the gross domestic product and is the main component for the growth of human capital in the long term. This positive association also indicates that higher education spending raises efficiency, contributing to further development in economic activity. Similarly, public investment is also tending to boost the consumer price index. Government expenditure also influences production, as overall demand for goods and services would rise and result in increased costs across the market due to higher spending. This shows that additional raises in gross education expenditure decline inflation by 0.91401 percent. In the end, the association between gross domestic savings and inflation is discussed. The association between gross domestic savings and inflation is negative and highly significant. Since 2008, aggressive domestic savings have been downward. More importantly, the perceptible change in investors' preference for physical assets is relative to financial assets. This can be attributed to increased inflation. The coefficient of GDS expects that a 1 percent change in gross domestic savings will change inflation by -0.82367 percent in the opposite direction.

Conclusions and Policy Implications
The main purpose of the study to investigates the impact of monetary policy on inflation and investment over the period of 1972 to 2019. The study employs econometric methodology named autoregressive distributed lq model for this purpose. The empirical findings show that in the long-run impact of money supply has significant and positive on investment and other variables trade, foreign direct investment, gross domestic saving, services are also positively associated with the investment. While other variables interest rate and exchange rate negatively linked with investment. Empirical findings of the second econometric model show the core variable money supply has a significant and positive on inflation including other variables foreign direct investment, exchange rate, exports and government expenditures on education but other variables interest rate, gross domestic saving and agriculture output negatively linked with inflation. The study's findings support a currency strategy, where the principal cause of inflation is money supply when any rise in interest rates leads to inflationary pressures being minimized in Pakistan. Whereas the increase in domestic revenue meets consumer demand and decreases inflationary pressure, the effects are obvious. This gives a powerful message to economic planners that regulating the interest rate, money provision and country production level will support inflation-focusing policies. Although SBP has little flexibility in setting growth and inflation goals, it acquires the capacity to enforce these objectives. The main instrument of monetary policy in Pakistan is reverse repo or policy rate. The study indicates that a stable monetary policy should
be introduced to improve a country's economic development. Monetary policy should be used to build an agreeable environment of uncertainty that draws both domestic and outside investors to promote economic growth. Economic growth can be accomplished by encouraging efficient monetary policy steps for inflation stability and attractive interest rates. In the currency market, it is also a requirement to have a favourable interest rate for international and domestic investments to improve the region's economic growth. The interest rate is also a more popular variable for the money sector.

References


**APPENDIX**

<table>
<thead>
<tr>
<th>Diagnostic Checks</th>
<th>Investment Model</th>
<th>Inflation Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>$R^2$</td>
<td>0.999</td>
<td>0.999</td>
</tr>
<tr>
<td>Adj $R^2$</td>
<td>0.998</td>
<td>0.999</td>
</tr>
<tr>
<td>LM Test</td>
<td>2.787 (0.079)</td>
<td>0.241 (0.786)</td>
</tr>
<tr>
<td>J.B Test</td>
<td>1.649 (0.438)</td>
<td>2.184 (0.335)</td>
</tr>
<tr>
<td>Hetero Test</td>
<td>1.554 (0.172)</td>
<td>0.262 (0.771)</td>
</tr>
<tr>
<td>Ramsey reset test</td>
<td>0.759 (0.475)</td>
<td>0.532 (0.471)</td>
</tr>
</tbody>
</table>

The above table shows the diagnostic results of both models (Investment and Inflation model) and results revealed that models are free from problems like serial correlation, heteroskedasticity, normality and stability issues.
The following figures show stability tests (CUSUM & CUSUMQ) for both models.

**Figures**

CUSUM (Investment Model)

CUSUMQ (Investment Model)

CUSUM (Inflation Model)

CUSUMQ (Inflation Model)
Analysis of Livelihoods and Food Security among Rural Households of Khyber Pakhtunkhwa, Pakistan

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ARTICLE DETAILS

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Livelihoods, Food Security, Farm and Non-Farm Strategies, Calorie intake method, Logit model

JEL Classification
Q5, R2, R210

Purpose: This study was an effort with the aim to study livelihoods and food security status in rural areas of Khyber Pakhtunkhwa province, Pakistan.

Design/Methodology/Approach: Three districts of the province were confined and research data from randomly selected 336 households were collected. Livelihoods was analyzed by investigating livelihood strategies pursued by the households while food security status was measured through calorie intake method.

Findings: The study examined that diversified livelihood strategies were pursued by the households; and noticed that farm was the prime strategy of 34.52% households while non-farm was the strategy of 65.48% households. The incidence of food secure and insecure households was 57.44% and 42.56%, respectively; and FSI of the food secure households averaged 1.26 and food insecure households averaged 0.79.

Implications/Originality/Value: There is dire need to provide opportunities for a sustainable livelihood strategy at household level that could ultimately move them from worse to better food security status.

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Introduction
The concepts of livelihood are varying widely and dynamic as they are depending on the level of development of the targeted region or country (UNODC, 2011). The livelihood has broader meaning than income and include everything necessary for living. It encompasses the activities that undertake as well as planned by men and women to build their livelihoods and that create household’s survival means (DFID, 1999).
A significant outcome of the livelihood is the provision of basic requirements such as food. It implies that household and all individuals of the household can always create, acquire, or to get adequate, healthy, and culturally acceptable food at all times. Reduced food intake (both quality and quantity) can have an impact on health, well-being, and capacity to work, which can then loop back to increase susceptibility (Pasteur, 2002). The keys of risks to people’s food security are determined by their livelihoods (Lovendal et al., 2006). Food security is mainly depending upon the people’s livelihood strategies and possession and access to livelihood assets (Farooq, 2009). Addressing the issue of food insecurity without taking into account the accompanying security of the livelihoods of households may be insufficient for making appropriate and effective policy recommendations (Oni and Fashogbon, 2013).

Understanding livelihood dimensions to food security; in which people’s struggle with assets to generate activities for income and fulfill the basic need of a secure food; is very promising to deal with food security concerns (Scoones, 2009). The nexus between livelihoods and food security is not simple and is altered by varieties of factors that change across contexts and over time. At household level, food security can be determined by food consumption, and this could be affected by household’s livelihood strategies and earnings.

People of Pakistan are facing many challenges in livelihoods and food security as the country confronted (and still continue to confront) the crises of food, fiscal, and functional democracy, fragility of climate and frontier (referring to the war on terrorism across the border between Pakistan and Afghanistan). The cumulative effect of these crises is intimidating to livelihoods and food security, particularly in rural Khyber Pakhtunkhwa province. Rural population of the province are facing disparities in use and allocation of overburden resources. These people are engaged in a variety of livelihood activities to get food though coping many challenges and threats to livelihoods. The situation within the province and its surrounding developing a sense of inefficient availability and use of livelihood resources as well as worsen food insecurity among the rural households.

Analyzing livelihoods of rural people are important because it helps to understand people’s livelihoods strategies intend to produce better food to understand livelihoods and food security among the rural households of Khyber Pakhtunkhwa province of Pakistan, the study was carried-out in Peshawar valley with the objectives; to investigate livelihood strategies that rural population are engaged with, and to study food security situation.

Materials and Methods
Three districts of the Peshawar valley namely Charsadda, Nowshera and Mardan were the universe of the study in which total 6 villages were randomly selected. Due to a variety of factors such as human and financial constraints, selecting all of the households in the study area is a big challenge. Therefore, proportional allocation technique (Cochran, 1977) was applied and data were collected from five percent households in each village. Household was taken as unit of analysis, and primary data was gathered from 336 randomly selected households. Different statistical techniques were used and data were analyzed using both descriptive and analytical approaches. Analysis was made with the help of MS Excel and SPSS, in accordance with the objectives of the study.

Rural households were engaged in a variety of livelihood strategies having broader categories of farm and non-farm. The sub-strategies under each broader group that were pursued by the households were also investigated. On the other hand, calorie intake approach was employed to assess food security status, as used by Karim et al. (2018), Aziz et al. (2016), Bashir et al. (2013) and Kuwornu et al. (2013). The data of food consumption by each household were transformed into calories per day per adult equivalent with the help of Food Composition Table for Pakistan
(Department of Agricultural Chemistry, Khyber Pakhtunkhwa Agricultural University Peshawar, 2001), and Pakistan basic adult equivalence scale (GoP, 2016) that assigned a weight of 0.8 to each individual below age of 18, and weight of 1 to each individual age 18 and above. The threshold level of 2350 Kcal/adult equivalent/day (GoP, 2016) was applied and food security index was computed to divide households into food secure and insecure. The formula of the index is given as:

$$Z_i = \frac{Y_i}{R}$$

(1.1)

Where;

$Z_i$ = Food Security Index of $i^{th}$ household

$Y_i$ = Actual Daily Calorie Intake of $i^{th}$ households

$R$ = Recommended Daily Calorie Requirement of $i^{th}$ household

When;

$Z_i \geq 1$, the status of food is considered to be secure for $i^{th}$ household and

$Z_i < 1$, the status of food is considered to be insecure for $i^{th}$ household

A household is therefore food secure whose daily calorie intake per adult equivalent are equal or higher than recommended daily calorie per adult equivalent and those whose daily calorie intake per adult equivalent are below the recommended daily calorie required were considered food insecure households.

Logistic regression was used following Bashir et al. (2013), Oni and Fashogbon (2013), Alemu (2012), Arega (2012), Bashir et al. (2012), and Titus and Adetokunbo (2007). The model can be written as:

$$L_i = \ln\left(\frac{p_i}{1-p_i}\right) = \beta_0 + \sum_{i=1}^{7} \beta_i X_i + \sum_{i=1}^{2} \beta_i D_i + \epsilon_i$$

(1.2)

Where,

$$\left(\frac{p_i}{1-p_i}\right)$$ = Odds ratio and $\ln\left(\frac{p_i}{1-p_i}\right)$ is called logit or log odds and act as dependent variable

$P_i$ is the probability of $i^{th}$ household to become food secure and $X_i$ and $D_i$ is the vector of the independent variable of that household. Therefore,

The parameter $\beta_0$ gives the log odds of a household being food insecure (when $X_i$ or $D_i = 0$),

$\beta_i$ shows how these odds differ for food secure households (when $X_i$ or $D_i \neq 0$) and

$\epsilon_i$ represents error term

By incorporating independent variables ($X_1$: Household Size, $D_1$: Primary livelihood activity of farm, $D_2$: Secondary livelihood activity engagement, $X_2$: Household monthly income, $X_3$: No. of economically active member, $X_4$: Education level of household head, $X_5$: Age of household head, $X_6$: Ruminant possession, $X_7$: Dependency ratio) in equation (1.2), the model can be expressed as:

$$\log it (P_i) = \beta_0 + \beta_1 X_1 + \beta_2 D_1 + \beta_3 D_2 + \beta_4 X_2 + \beta_5 X_3 + \beta_6 X_4 + \beta_7 X_5 + \beta_8 X_6 + \beta_9 X_7 + \epsilon_i$$

(1.3)

Results and Discussion

Table 1 presents that household size in the study area was averaged 8.03, range 2 to 20 individuals in a household and standard deviation 3.07. Adult equivalent per household was between 2 to 18 and averaged 7.19 in overall sample households. A household was comprised men, women and children in an average of 1.86, 1.98 and 4.18, standard deviation of 1.10, 1.16 and 2.16, respectively. The average of male (4.0) was more or less the same with the average of female (4.03). The finding was confirmed by Pakistan Bureau of Statistics (Census Report, 2017) found that household size is 7.99 in rural Khyber Pakhtunkhwa province. In the study area, on average household earning members was 2 with minimum 1, maximum 6 and standard deviation
of 1. The percentage of dependency per household averaged 76 percent with minimum 40 percent and maximum 93 percent with standard deviation 12. This was observed that high dependency and either one or two earners in majority of households can result feeble livelihood strategies with unfavorable livelihood outcome of the households.

### Table 1

**Household Composition and Size**

<table>
<thead>
<tr>
<th>Particulars</th>
<th>Members per household</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Average</td>
</tr>
<tr>
<td>Men</td>
<td>1.86</td>
</tr>
<tr>
<td>Women</td>
<td>1.98</td>
</tr>
<tr>
<td>Children</td>
<td>4.18</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>8.03</strong></td>
</tr>
<tr>
<td>Male</td>
<td>4</td>
</tr>
<tr>
<td>Female</td>
<td>4.03</td>
</tr>
<tr>
<td>Adult Equivalent</td>
<td>7.19</td>
</tr>
<tr>
<td>Earning member</td>
<td>2</td>
</tr>
<tr>
<td>Dependent member</td>
<td>6</td>
</tr>
<tr>
<td>Dependency ratio</td>
<td>0.76</td>
</tr>
</tbody>
</table>

Results in Table 2 and Table 3 depict that diversified livelihood strategies were pursued by the rural sample households; not merely engaged in farm but a large portion of households were involved in non-farm activities while some others adopted both. It was noticed that farm strategy was the prime strategy of 34.52% households and non-farm was the 65.48% households. The study captured sub-strategies for both of farm and non-farm and provide details that crop production was the dominant strategy among farm where 43.97% households were engaged. Beside this, farm labour engaged 31.90% households, farm trade 12.93% households, and each “farm service work” and livestock engaged less than 10% households. The non-farm leading and second highest sub-strategy were “casual labour” and “small-scale business” that offering a source of primary livelihood strategy to 20.19% and 17.73% households, respectively. Similarly, explored categories and sub-strategies of the secondary livelihood strategy adopted by the households present that 53.27% of the households were engaged in secondary livelihood strategy though a large proportion of households i.e. 46.73% were having no secondary livelihood strategy. Pursuing secondary strategy, 27.08% of the households performed farm strategy while 26.19% non-farm strategy.

**Table 2:**
## District Wise Household's Primary Livelihood Strategy

<table>
<thead>
<tr>
<th></th>
<th>District</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Charsadda</td>
<td>Mardan</td>
</tr>
<tr>
<td>Farm</td>
<td>34</td>
<td>35</td>
</tr>
<tr>
<td></td>
<td>(27.87)</td>
<td>(38.46)</td>
</tr>
<tr>
<td>Non-farm</td>
<td>88</td>
<td>56</td>
</tr>
<tr>
<td></td>
<td>(72.13)</td>
<td>(61.54)</td>
</tr>
<tr>
<td>All</td>
<td>122</td>
<td>91</td>
</tr>
<tr>
<td></td>
<td>(100)</td>
<td>(100)</td>
</tr>
</tbody>
</table>

## District wise Household's Secondary Livelihood Strategy

<table>
<thead>
<tr>
<th></th>
<th>District</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Charsadda</td>
<td>Mardan</td>
</tr>
<tr>
<td>Farm</td>
<td>19</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>(15.57)</td>
<td>(21.98)</td>
</tr>
<tr>
<td>Non-farm</td>
<td>29</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>(23.77)</td>
<td>(17.58)</td>
</tr>
<tr>
<td>No secondary</td>
<td>74</td>
<td>55</td>
</tr>
<tr>
<td>strategy</td>
<td>(60.66)</td>
<td>(60.44)</td>
</tr>
<tr>
<td>All</td>
<td>122</td>
<td>91</td>
</tr>
<tr>
<td></td>
<td>(100)</td>
<td>(100)</td>
</tr>
</tbody>
</table>

Food security status of the households is presented in Table 4. Data shows that the incidence of food secure and food insecure households in the area were 57.44% and 42.56%, respectively. Food security index of the food secure households averaged 1.26 with standard deviation of 0.18, while averaged 0.79 with standard deviation of 0.12 for food insecure households. Based on surplus index, food secure households consumed daily calorie per adult equivalent in excess by 26% of the threshold level. Whereas food insecurity gap represents that food insecure households consumed daily calorie per adult equivalent by 21% less than the threshold level. The measurement consigned that the daily calorie intake per adult equivalent of the overall households was averaged 2327 kcal with minimum 1198 kcal and maximum 5720 kcal, and specifically for food secure households and food insecure households averaged 2965 kcal and 1854 kcal, respectively. These results are more or less similar with the findings of the study conducted by Aziz et. al. (2016), found that daily calorie intake per adult equivalent among the food insecure households were 1803 kcal in Pakistan; and the incidence of food insecure households were 67 percent in Pakistan and 65 percent in Khyber Pakhtunkhwa province. Figure 1 presents household’s food security status in comparison with average calorie intake of each of the status category.

### Table 4: Food Security Status of the Sample Rural Households

<table>
<thead>
<tr>
<th>Description</th>
<th>Food Security Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food Security Index (Mean)</td>
<td>1.26</td>
</tr>
<tr>
<td>Standard deviation of Food Security Index</td>
<td>0.18</td>
</tr>
<tr>
<td></td>
<td>0.79</td>
</tr>
<tr>
<td></td>
<td>0.12</td>
</tr>
</tbody>
</table>
Food security surplus index / food insecurity gap 0.26 0.21
Calorie intake per day per adult equivalent (average) 2965 1854
Percentage of household 42.56 57.44
Number of households 143 193
Overall calorie intake per day per adult equivalent (average) 2327

### Table 5: Logit Model Estimates for Factors Affecting Households’ Food Security Status

<table>
<thead>
<tr>
<th>Variables</th>
<th>Coefficient (B)</th>
<th>Standard error (S.E.)</th>
<th>Wald</th>
<th>Sig. ($p$-value)</th>
<th>Odds (Exp(B))</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Model I:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>1.348</td>
<td>3.029</td>
<td>.198</td>
<td>.656 NS</td>
<td>3.849</td>
</tr>
<tr>
<td>Household Size</td>
<td>-.443</td>
<td>.146</td>
<td>9.271</td>
<td>.002*</td>
<td>.642</td>
</tr>
<tr>
<td>Primary livelihood activity of Farm</td>
<td>-.485</td>
<td>.307</td>
<td>2.489</td>
<td>.115 NS</td>
<td>.616</td>
</tr>
<tr>
<td>Secondary livelihood activity</td>
<td>.0136</td>
<td>.307</td>
<td>.195</td>
<td>.659 NS</td>
<td>1.145</td>
</tr>
<tr>
<td>Household monthly income</td>
<td>.000</td>
<td>.000</td>
<td>17.457</td>
<td>.000*</td>
<td>1.000</td>
</tr>
</tbody>
</table>

**Figure-1: Household food security status in comparison with average calorie intake**

Logit model was fitted to estimate the effects of the hypothesized explanatory variables on the probabilities of being food secure or not. Goodness-of-fit was assessed for the overall fit of the models via Omnibus tests of model coefficients, Hosmer and Lemeshow test, pseudo $R^2$ and classification table. It was concluded from the results i.e. prediction success of 70.5%, Omnibus tests $\chi^2$ values 86.062 ($p$-value 0.000), Cox & Snell $R^2$ 0.226 and Nagelkerke $R^2$ 0.304, that the fitted model is a good model. Among the total (9) hypothesized variables, significant variables with respect to the households’ food security at less than 5% probability level are “household size”, “monthly income of the household” and “age of the head of household”. Variable’s coefficient with positive signs that showed direct relationship with household food security; are “secondary livelihood activity engagement”, “income of the household”, “education level of household head”, “age of household head”, and “possession of ruminant(s)”. 

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950
The results of the model show that household size had a negative sign of coefficient; implies that household size is inversely related with the level of food security of the sample households. This implies that household having large size tends to be food insecure than those with small size. This suggests that a household with large number of persons per household could face most likely food insecurity and most probably will demand more for livelihood outcome in terms of food from the adopted livelihood strategy. For household size the value of odds (0.642) is in favor of household gradual movement towards decreasing food security status if the size increases while keeping other variables constant. These results confirmed by the findings of the study conducted in Pakistan by Anwar et.al. (2017), Aziz et. al. (2016) and Bashir et.al (2012) reported negative relationship between food security level and total household members.

D1 (Primary Livelihood Activity)
The negative sign of coefficient indicates that farm activity of the household is inversely related with food security. This implies that those households with primary livelihood activity of farm tend to be food insecure than those with the non-farm livelihood activity. Restricted access to and degradation of limited agricultural land, low outcome of the farm activities, and large household size could be the most probable reasons for lack of access to adequate food. The findings supported by Osarfo et al. (2016) stated that higher probability of involvement of households in non-farm activities had improved food security status than that of involvement in farm activities.

D2 (Secondary Livelihood Activity)
Beside primary livelihood strategy, in secondary strategy few do farm activities, few non-farms while quite a few don’t have any secondary activity, however engagement in more than one activity don’t mean to achieved a minimum required outcome by the rural household. The positive sign of coefficient indicates directly relationship among the household’ engagement in secondary livelihood activity with food security in terms of increases calories intake. Manlosa et al. (2019) who reported that more livelihood strategies improve food security. Aziz et. al. (2016), households pursued multi and diversified livelihood strategies have lesser probability of being food insecure than those relying on single strategy.

X2 (Household Monthly Income)
The variable has positive influence on food security status of the rural households and statistically significant at less than 5% probability level. These results indicate that increase in household’ monthly income will increase the probability of being food secure (odds-ratios of 1.000035). These results are confirmed by Ahmed et al. (2017) rural household’ food security status had a significant and positive relationship with household monthly income.
X3 (No. of economically active member)
Sign of the coefficient implies that household’ food security has inverse relation with income earning member of household. The inverse relation might be due the cause of low productivity from limited livelihood capital, self-employment or underemployment, high inflation rate, limited opportunities to work, non-sustainable source of income, and inflate spending on non-food items. Ahmed et al. (2017) stated that poor health (Ullah & Muhammad, 2020), and sanitation conditions, low purchasing power, and high food prices and increase in debit may adversely affect household’ food security status. Bashir et al. (2012) found that total earner in a household was non-significant in rural households of South and Central Punjab.

X4 (Educational Level of Household Head)
The result implies that household with high educational level by the head of household are more likely to be food secure than those who have low level of education. The odd ratios (1.026) reveal that holding other variables constant, a change in household head education level by one unit will increase probability of household’ being food secure. These findings are in line with the study of Manlosa (2019), found a positive association of educational attainment of the household head with food security. Abdullah et al. (2017) stated that education can contribute to improve food security level in rural northern areas of Pakistan.

X5 (Age of Household Head)
The variable has significantly positive relationship with food security status; and clarify that increase of household’ head age could increase the level of food security and decrease the level of food insecurity of that household in rural areas. The odds ratios i.e. 1.039 portray favor of impact on level of rural household food security if a unit changed in age of household head. Abdullah et al. (2017), households with older head had better food security status as compare to the younger head in rural northern areas of Pakistan. Arene (2010) found that older household heads had higher probability of being food secure than the younger one.

X6 (Ruminants)
Possession of ruminant in sample rural household is considered being an important factor for increasing level of household food security. Ruminant possession showed direct and significant relationship at 5% significance level, with food security. Keeping other things constant, possession of livestock by rural household more probably secure the food of that household as odds of the possession of livestock is 1.619. This was confirmed by Bashir et al. (2013) ruminants play a significant and positive role in food security of the rural households in Punjab province of Pakistan.

X7 (Dependency Ratio of Household)
Dependency ratio of the household as negative sign of coefficient showed an inverse relationship with food security of the household; means that with increase in household dependency ratio would more probably decrease level of food security or increase level of food insecurity. High dependency ratio could be resulted a worse condition of the level of food security as this could put pressure on consumption rather than production of the limited strategies. The odds ratio of dependency ratio represents that keeping other things constant, with the increase of one unit of dependency ratio is more probably to decrease food security level by factor of odds 0.341 and vice versa. The findings are in line with the study of Aziz et. al. (2016), household is more likely of being food secure having lesser dependency ratio and vice versa.

Conclusions and recommendations
Diversified livelihood strategies were pursued where a large portion of the households were involved in non-farm strategies against the farm. Sub-strategies of the farm and non-farm were investigated where crop production and “casual labour” were the leading strategies, respectively.
Around half of the households derive their livelihoods adopting single strategy while others engaged in more than one strategy. Significant variables with respect to the status of household’s food security are “household size”, “monthly income of the household” and “age of the head of household”. Variable’s that showed direct relationship with household food security; are “secondary livelihood activity engagement”, “income of the household”, “education level of household head”, “age of household head”, and “possession of ruminant(s)”. The study suggests that there is dire need to invest in livelihoods means in order to improve and increase the sustainability of livelihood strategy for a better livelihoods’ outcome of the population. Food insecure households must be treated through provision of opportunities of sustainable livelihood strategy which will ultimately move households from worse to best food security outcome.

References
AIOU. (2001). Food Composition Table for Pakistan. Allama Iqbal Open University, Islamabad, Pakistan.
Bashir, M.K., Schilizzi, R. Pandit. (2012). Food security and its determinants at the cross roads in Punjab Pakistan, Working Paper 1206. School of Agricultural and Resource Economics, University of Western Australia, Crawley, Australia


The Endogeneity Quagmire Empirical Evidence from Telecommunication Industry of Pakistan

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ARTICLE DETAILS

Purpose: The current research aims to analyze the particular quagmire of endogeneity by considering panel data with the renowned challenge of limited periods.

Design/Methodology/Approach: This study employed panel data generalized method of moments (GMM) approach.

Findings: Results show a presence of a significant and a negative relationship between operational risk and management performance and returns, thereby emphasizing the importance of operational risk management for enhanced performance in light of the theory of performance frontiers introduced by Schmenner and Swink in 1998.

Implications/Originality/Value: The results suggest that the focus on operational risk management should be revitalized if the firms seeks an improved performance and a sustainable competitive advantage.

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Introduction

The role of risk management has garnered significant attention of the years and often becomes the subject of the spotlight following corporate failures and crashes. Researchers and experts have followed a reductionist approach and broken down “Risk” into several categories. Of these categories, Operational Risk has remained one of the most underrated risks and received well-deserved attention by the Basel Committee in the 1996 reforms.

Myriad researches have attempted to explore the impact of operational risk on a firm. These include Mseddi and Abid, (2004), etc. Among the service industries used in similar research, available literature that seeks the examine the criticality of operational risk on novel industries such as Telecommunications is extremely scarce. Telecommunications, being a complex area can have a plethora of operational failures manifesting in the form of service level agreements.
SLAs), regulatory penalties by authorities, employee risks (retention, motivation, frauds, training, etc), processes risks, and so on. Operational Risk Management offers a potential solution for addressing the requirement for a centralized approach for the management of all such risks. Examining the applicability of this idea in an emerging industry would be ideal in this regard as novel and emerging industries are highly regulated, flexible, and offer transparent interpretations when juxtaposed with matured industries.

Another crucial factor is that rationalist researchers have focused on the explanation of the phenomenon of operational risk, while empiricists divert their efforts in analyzing the phenomenon through empirical testing. From an empirical point of view, the effectiveness of the research is contingent upon the underlying assumptions and how well the research models incorporate the ad-infinum variables which differ within and across the samples. From a rationalist’s point of view, these variables or changes can be broadly understood as endogeneity that has impacted tremendous research and their interpretations. Addressing the issue of endogeneity in a complex area of Operational Risk becomes imperative in this context of Telecoms. Telecoms undertake long-haul projects with a life span extending up to 40 years, according to which the “Risk Avoidance “option is often ruled out. Williams et al, (1998) classified management of operational risk as pivotal for telecoms due to this assumption.

This research follows a holistic view of examining the phenomenon of operational risk in telecommunication organizations with minimum subjectivity in empirical testing. The purpose of this paper is double faceted. First, to explore whether operational risk influenced a telecommunication organization. Second, to thoroughly justify the appropriateness of an econometric model that adequately applies in the Telecommunication Industry of Pakistan with each company being significantly different from the other in different aspects (Endogeneity). Pakistan Telecom Industry is one of the fastest-growing industries in South Asia with nearly 100 million cellular users employing almost 1.36 million people.

Operational risk has been examined in detail by researchers, however, one easily observes the proclivity of the application of this concept to the financial sector. The paper contributes to the existing literature by presenting the application of operational risk to Telecoms. The paper also addresses the recommendation of inclusion of an inter-temporal choice of model as highlighted by Basak and Buffa (2015). Other contributory aspects include Additional dimensions of the volatility of earnings and earnings cover is encouraged for future research and segregation of performance metrics (returns) for internal management and shareholders.

The remainder of the paper is presented as follows: Section 2 explains the problems associated with endogeneity in panel data, Section 3 proposes the methodology to deal with the issue of endogeneity in context of telecoms, Section 4 presents the empirical analysis of the study followed by conclusions and discussions on the findings of the paper.

Dealing with Endogeneity
The term endogeneity is often quoted in analyzing results from regression models and refers to a state where explanatory variables correlate with the error term or whether two error terms show a correlation whenever we deal with structural equation modeling. The problem with endogeneity is that it can result in inconsistent estimates i.e. estimates do not represent true values as the sample size is increased, which can lead to potential wrong inferences along with misleading conclusions and incorrect theoretical interpretations. In the presence of endogeneity bias, according to Ketokivi and McIntosh (2017), researchers may not even get the right coefficient signs for their studies.
Recognizing that other models may exist, which are equally plausible on logical grounds, is considered excellent academic practice in most cases. When developing hypotheses and models, researchers should rely on solid theoretical justifications to guide them in the right direction. According to Wawro (2002), the estimators which are calculated using 2SLS/3SLS approach will be consistent, however, these estimates will be inefficient as compared to the GMM model.

GMM approach eliminates endogeneity by "internally transforming the data"- Internal transformation refers to a statistical technique in which a variable's prior value is removed from its current value (Roodman, 2009). It is therefore possible to lower the number of observations while simultaneously increasing the efficiency of the GMM model through this procedure (internal transformation) (Wooldridge, 2012). Hence GMM approach is one of the best techniques for elevating endogeneity.

**Data and Methodology**

This study examines the relationship between operational risk and a firm’s financial performance.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
<th>Units</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>AU</td>
<td>Asset Utilization</td>
<td>Ratio</td>
<td>Financial Statements</td>
</tr>
<tr>
<td>ROA</td>
<td>Return on Assets</td>
<td>Ratio</td>
<td>Financial Statements</td>
</tr>
<tr>
<td>ROE</td>
<td>Return on Equity</td>
<td>Ratio</td>
<td>Financial Statements</td>
</tr>
<tr>
<td>RE</td>
<td>Reserves to Equity Ratio</td>
<td>Ratio</td>
<td>Financial Statements</td>
</tr>
<tr>
<td>ER</td>
<td>Efficiency Ratio</td>
<td>Ratio</td>
<td>Financial Statements</td>
</tr>
<tr>
<td>DOL</td>
<td>Degree of operating leverage</td>
<td>Ratio</td>
<td>Financial Statement</td>
</tr>
</tbody>
</table>

For measuring a firm’s performance, we used return on assets, since the majority of the companies in the Pakistan telecommunications industry are from the private sector, the current research has relied on the classical measures of organizational performance i.e. Return on Equity, Return on Assets, and Asset Utilization. Return on Equity is preferred for measuring the efficiency of management and an entity’s financial performance. Gatsi et al., (2016) argue that ROE is the most critical indicator for measuring financial performance as well as growth potential. The use of asset utilization proxy is in accordance with the research carried out by Wang (2010). The efficiency ratio, which may be determined by dividing operating expenditures by gross earnings, can be used as a proxy for operational risk. The population of this study consists of 16 companies from the telecommunication sector. The selection of the companies is based on telecom licenses issued by Pakistan Telecommunication Authority. The sample period ranged from 201-2017.

**Econometric Model**

\[ AU_{it} = \alpha_0 + \beta_1 RE_{it} + \beta_2 DOL_{it} + \beta_3 ER_{it} + \epsilon_{it} \] ..................................................3.1

\[ ROA_{it} = \alpha_0 + \beta_1 RE_{it} + \beta_2 DOL_{it} + \beta_3 ER_{it} + \epsilon_{it} \] ..................................................3.2

\[ ROE_{it} = \alpha_0 + \beta_1 RE_{it} + \beta_2 DOL_{it} + \beta_3 ER_{it} + \epsilon_{it} \] ..................................................3.3
Where \( i \) represents a firm or a company \((i=1…14)\) and \( t \) represents period \((t=2012…2017)\), equation 1-3 is a general specification allowing for dynamic operational risk effects, and also a stochastic error term which is represented by \((\varepsilon)\).

**Generalized Method of Moments**

The Linear Dynamic Panel Model was utilized in this investigation (Arellano and Bond, 1991). The model incorporates the impacts of unobserved panel-level effects, which can be either fixed or random in distribution. This technique has been developed particularly for cases in which cross-sections are greater than the periods (Arellano and Bond, 1991).

In this model, there are also a number of analyses that may be used, such as homoscedasticity, cross-sectional, Linear Factor Models, and the Sargan test of over-identifying restrictions. GMM delivers more reliable judgments because it employs approaches that specifically target orthogonality criteria that were present in both the lagged variable and the error term (Arellano & Bond, 1991; Arellano & Bover, 1995). Even more robust and trustworthy measurements may be obtained using GMM, which handles autocorrelation, heteroscedasticity, and endogeneity problems (Blundell and Bond, 1998; Windmeijer, 2005). The following regression equation is an example:

\[
y_{it} - y_{it-1} = (\alpha - 1)y_{it-1} + X_{it}\beta + n_{it} + y_t + \varepsilon_{it} \tag{3.4}
\]

Where \( y \) is the logarithm of financial performance, \( X \) presents the range of descriptive variables other than insulated financial performance, \( \eta \) is an unnoticed industry specific effect, \( \gamma \) is a time-specific effect, \( \varepsilon \) is the error term, and the subscript “\( i \)” and “\( t \)” is organization and period, respectively. Equation (1.1) can be rewritten as:

\[
y_{it} = \alpha y_{it-1} + X'_{it}\beta + n_{it} + y_t + \varepsilon_{it} \tag{3.5}
\]

And to remove the industry-specific effects, Equation (3.5) is taken as first differenced, like the following:

\[
\Delta y_{it} = \alpha \Delta y_{it-1} + \Delta X_{it}\beta + \Delta y_t + \Delta \varepsilon_{it} \tag{3.6}
\]

To utilize this tool it is essential to account for possible endogeneity of the descriptive variables, and secondly, the difficulty resulting from establishing the latest error term, \( \Delta \varepsilon_{it} = (\varepsilon_{it} - \varepsilon_{it-1}) \), that is in connection with the lagged dependent variable, \( \Delta y_{it-1} = (y_{it-1} - y_{it-2}) \).

The GMM dynamic panel information estimator produces the following moment conditions when the error term, \( \varepsilon \), is assumed to be unlinked and the descriptive variables, \( X \), are assumed to be inadequately exogenous (that is, when the descriptive variables are orthogonal to the prospect realizations of the error term).

\[
E[y_{it-s}\Delta \varepsilon_{it}] = 0 \ for \ all \ s \geq 2, \ t = 3, ..., T \tag{3.7}
\]

\[
E[X_{it-s}\Delta \varepsilon_{it}] = 0 \ for \ all \ s \geq 2, \ t = 3, ..., T \tag{3.8}
\]

And so, the instruments for this differenced equation are descriptive variables that lagged at least twice. The GMM estimator depends upon above mentioned moment conditions is said to be different estimator (or difference GMM).
Empirical Analysis

Descriptive Statistics

<table>
<thead>
<tr>
<th>Description</th>
<th>AU</th>
<th>DOL</th>
<th>ROA</th>
<th>ER</th>
<th>RE</th>
<th>ROE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>0.539</td>
<td>-20.358</td>
<td>-0.012</td>
<td>2.629</td>
<td>0.198</td>
<td>0.131</td>
</tr>
<tr>
<td>Median</td>
<td>0.472</td>
<td>0.181</td>
<td>0.027</td>
<td>0.644</td>
<td>0.403</td>
<td>0.062</td>
</tr>
<tr>
<td>Maximum</td>
<td>1.296</td>
<td>15.717</td>
<td>0.423</td>
<td>150.220</td>
<td>3.910</td>
<td>3.271</td>
</tr>
<tr>
<td>Minimum</td>
<td>0.001</td>
<td>-1616.000</td>
<td>-1.057</td>
<td>-2.610</td>
<td>-7.024</td>
<td>-0.572</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>0.278</td>
<td>184.256</td>
<td>0.185</td>
<td>17.090</td>
<td>1.218</td>
<td>0.510</td>
</tr>
<tr>
<td>Skewness</td>
<td>0.435</td>
<td>-8.600</td>
<td>-3.088</td>
<td>8.528</td>
<td>-2.244</td>
<td>4.468</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>2.790</td>
<td>74.976</td>
<td>17.504</td>
<td>74.164</td>
<td>18.896</td>
<td>26.168</td>
</tr>
</tbody>
</table>

For performance-related measures, the Return on Assets (ROA) of Telecommunications has a mean of -0.012, while the minimum and maximum are -1.057 and 0.423 percent respectively. Return on equity (ROE) has a mean value of 0.131 with minimum and maximum values of -0.572 and 3.271. Asset utilization has a mean value of 0.539, the minimum and maximum values are 0.001 and 1.296. With regards to operational risk, the mean efficiency ratio (ER) is 0.688 while the maximum and minimum value is 4.998 and -2.610 respectively. Reserves to Equity ratio have a mean of 0.198, while the maximum and minimum are 3.910 and -7.024 respectively.

For testing multicollinearity, regression, and variance inflation test have been conducted. The tables below show the results of a simple regression of variables and variance inflation factor (VIF). Results of regression indicate the absence of multicollinearity. For VIF, a value greater than 10 is an indicator of multicollinearity of severe nature. Since the highest value given in the table below is 1.38, it can be reasonably concluded that multicollinearity is not a problem for the data used in the study.

<table>
<thead>
<tr>
<th>Variable</th>
<th>VIF</th>
<th>1/VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>ER</td>
<td>1.38</td>
<td>0.722057</td>
</tr>
<tr>
<td>RE</td>
<td>1.37</td>
<td>0.730049</td>
</tr>
<tr>
<td>DOL</td>
<td>1.03</td>
<td>0.974529</td>
</tr>
<tr>
<td>Mean VIF</td>
<td>1.26</td>
<td></td>
</tr>
</tbody>
</table>

Correlation values in table 4.2 are below the threshold of 0.9 which states that there no multicollinearity among the variable of the study. Table 4.3 shows VIFs of all values below 2, affirming that multicollinearity will not affect the coefficients and p-values.
This section details the findings of the application of panel data models Fixed Effect, Random Effect, and GMM. Since our relevant model for the research is GMM, results of the Fixed Effect and Random Effect models are presented for the sake of comparison.

Table 4.7: Comparison of Results - Fixed and Random Effect Regression Vs GMM One-Step & Two-Step as Performance as Dependent Variable

<table>
<thead>
<tr>
<th>Variables</th>
<th>Fixed Effect</th>
<th>Random Effect</th>
<th>Generalized Method of Moments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>One Step Results</td>
<td>Two-Step Results</td>
<td></td>
</tr>
<tr>
<td>Asset Utilization (AU) is the dependent variable</td>
<td>0.363* (0.162)</td>
<td>0.364* (0.057)</td>
<td></td>
</tr>
<tr>
<td>AU L1</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>DOL</td>
<td>0.002 (0.004)</td>
<td>0.002 (0.004)</td>
<td>-0.003* (0.004)</td>
</tr>
<tr>
<td>ER</td>
<td>0.007 (0.017)</td>
<td>0.007 (0.016)</td>
<td>0.002* (0.020)</td>
</tr>
<tr>
<td>RE</td>
<td>-0.004 (0.017)</td>
<td>-0.003 (0.017)</td>
<td>-0.004** (0.012)</td>
</tr>
<tr>
<td>Return On Assets (ROA) is the dependent variable</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ROA L1</td>
<td>-1.0124* (0.047)</td>
<td>-1.0135* (0.009)</td>
<td></td>
</tr>
<tr>
<td>DOL</td>
<td>0.002 (0.004)</td>
<td>0.003 (0.004)</td>
<td>0.001 (0.003)</td>
</tr>
<tr>
<td>ER</td>
<td>-0.014 (0.018)</td>
<td>-0.011 (0.017)</td>
<td>-0.047 (0.029)</td>
</tr>
<tr>
<td>RE</td>
<td>-0.080* (0.017)</td>
<td>-0.074* (0.017)</td>
<td>-0.088* (0.004)</td>
</tr>
<tr>
<td>Return On Equity (ROE) is the dependent variable</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ROE L1</td>
<td>0.376* (0.166)</td>
<td>0.373* (0.010)</td>
<td></td>
</tr>
<tr>
<td>DOL</td>
<td>-0.030** (0.014)</td>
<td>-0.017 (0.055)</td>
<td>-0.009 (0.011)</td>
</tr>
<tr>
<td>ER</td>
<td>0.100*** (0.058)</td>
<td>0.047 (0.053)</td>
<td>0.278 (0.225)</td>
</tr>
<tr>
<td>RE</td>
<td>-0.067 (0.060)</td>
<td>-0.079 (0.055)</td>
<td>0.053 (0.138)</td>
</tr>
</tbody>
</table>

*, **, *** represents significant at 1%, 5% and 10% respectively and standard errors are in parenthesis

Our main methodology in this research study is the generalized method of moments (GMM) as the number of cross-sections (14 firms) is greater than the period (5 years) shows better results. Results are further augmented by applying 1 & 2 step results of GMM, for return on assets, GMM step-1 shows a significant relationship of performance with all three proxies of operational risk, however, GMM step-2 shows an insignificant relationship for reserves to equity ratio in contrast to GMM step-1. GMM step 2 results are better for Return on Assets and Return on equity as compared to step-1. A common aspect of the results of both aspects is the presence of an insignificant relationship of Degree of operating leverage and performance measure (ROA). For return on equity, results under GMM step-2 are comparatively better. ROE shows significant relationships with operational risk under GMM step 2 and shows no such significant relationships for GMM step 1.

The efficacy of results of GMM Step-2 is further augmented by the deployment of Under identification and Over Identification tests as given in Tables 4.10 and 4.11. Under identification test results, insignificant P-values show that the number of instrumental variables used in GMM Step-2, are not less than endogenous variables in the data suggesting absence of under identification. Results of Over
Identification tests in Table 4.11 also show insignificant P-values i.e. Instruments are valid instruments. Over Identification test shows whether the instruments correlate with the error term. It considers both included and excluded variables and also accounts for collinearity. Both tests are widely used for analyzing the application of GMM.

According to Wooldridge (2001), GMM is well suited for obtaining efficient estimates that account for Heteroscedasticity and serial correlation. Table 4.9 shows presence of heteroscedasticity thereby fulfilling the recommendation of Wooldridge (2001). A basic Rule of Thumb is suggested by Arellano and Bond (1998) is that dynamic panel model should be initially estimated by pooled OLS and approaches like Fixed Effect. If the Difference GMM (Step 1) estimate obtained is close to or below the estimate of Fixed Effect, this indicates presence of downward bias due to weak instrumentation and results of system GMM (Step 2) will yield efficient estimates as compared to any other models.

From the point of view of accounting and finance, a possible challenge is the use of ROA and ROE values used in the research. Since both measures, rely on common returns, this might indicate the presence of a similarity to some extent. In order to account for this, Kruskal Wallis Test has been used. The test has been used to determine whether the impact of the three variables AU, ROA and ROE is the same. Higher value of H-stat as compared to Chi-Sq indicates the rejection of the null hypothesis that the three samples are the same.

### Other Tests

**Table 4.8: Ramsey reset test**

<table>
<thead>
<tr>
<th>Description</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ramsey RESET test AU</td>
<td>Ramsey RESET test ROA</td>
<td>Ramsey RESET test ROE</td>
<td></td>
</tr>
<tr>
<td>Ho</td>
<td>Model Has No Omitted Variables</td>
<td>Model Has No Omitted Variables</td>
<td>Model Has No Omitted Variables</td>
</tr>
<tr>
<td>F(3,70)</td>
<td>106.67</td>
<td>8.54</td>
<td>47.13</td>
</tr>
<tr>
<td>Prob &gt; F</td>
<td>0.00000</td>
<td>0.00010</td>
<td>0.00000</td>
</tr>
<tr>
<td>Results:</td>
<td>Model Is Truly Specified</td>
<td>Model Is Truly Specified</td>
<td>Model Is Truly Specified</td>
</tr>
</tbody>
</table>

**Table 4.9: Breusch-Pagan / Cook-Weisberg test for Heteroskedasticity**

<table>
<thead>
<tr>
<th>Description</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fitted values of AU</td>
<td>Fitted values of ROA</td>
<td>Fitted values of ROE</td>
<td></td>
</tr>
<tr>
<td>Ho</td>
<td>Constant Variance</td>
<td>Constant Variance</td>
<td>Constant Variance</td>
</tr>
<tr>
<td>Chi-Sq</td>
<td>0.27</td>
<td>1.14</td>
<td>19.69</td>
</tr>
<tr>
<td>Prob&gt; Chi-Sq</td>
<td>0.6061</td>
<td>0.2847</td>
<td>0</td>
</tr>
</tbody>
</table>

**Table 4.10: Under Identification Test**

<table>
<thead>
<tr>
<th>Hansen J Test Value</th>
<th>Model 1- With AU As Dependent Variable</th>
<th>Model 2- With ROA As Dependent Variable</th>
<th>Model 3- With ROE As Dependent Variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chi-Square</td>
<td>253.259</td>
<td>312.7749</td>
<td>331.5414</td>
</tr>
<tr>
<td>P-Value</td>
<td>0.0001</td>
<td>0.0034</td>
<td>0.0033</td>
</tr>
</tbody>
</table>

**Table 4.11: Over Identification Test**

<table>
<thead>
<tr>
<th>Sargan Test Value</th>
<th>Model 1- With AU As Dependent Variable</th>
<th>Model 2- With ROA As Dependent Variable</th>
<th>Model 3- With ROE As Dependent Variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chi-Square</td>
<td>7.771043</td>
<td>9.239353</td>
<td>9.72132</td>
</tr>
</tbody>
</table>
Table 4.12: Kruskal Wallis Tests (N-1) (5) D.O.F

<table>
<thead>
<tr>
<th>Chi-Square Value</th>
<th>11.071</th>
</tr>
</thead>
<tbody>
<tr>
<td>H-Stat Value</td>
<td>97.92</td>
</tr>
</tbody>
</table>

The findings are supported by the existing literature according to which improvement in capacity management primarily drives cost operational efficiency consequentially reducing the firm’s operational risk thereby enhancing asset utilization (Kuhn et al., 2012). The research supports the existing literature, in the sense that a negative relationship exists between operational risk and firm performance. Other studies that found the same result include the studies of Soyemi et al., 2014; Tamimi et al., 2015; and Maytham et al., 2013. In contrast with the existing literature, the present study did not find any relationship between the degree of operating leverage and return on assets. With regards to the impact of operational risk on performance is best reflected in the results of Return on equity. All three proxies of operational risk have resulted in significant relationships with return on equity in accordance with the results in the literature. A big departure from the results of the existing literature is the comparison of the strength of the significant relationships, the present study has found. Although the direction of the relationships is in accordance with the previous literature, the strength of the relationships is not. After comparison with the works of previous researchers, the possible reasons for the deviation of results are:

The sector undertaken for the study could be a very significant reason for deviation of the results from existing literature. For instance, while measuring the impact of operational risk the researches of Gill et al., (2014) comprised of Manufacturing companies only. Gadzo et al., (2019), Shamsuddin et al., (2018) and Muriithi and Waweru, (2017) included only commercial banks, Chen et al., (2015)’s research of operational risk and its implications on performance was based on the insurance industry. The current research included Telecommunication companies belonging to the service sector of Pakistan.

Conclusion

The research was aimed to explore the influence of “Risk”, more specifically “Operational risk” on organizational financial performance. After clarifying what risk and risk management is, the research continues with the discussion of the implications of risks inherent in business due to the course of its operations i.e. operational risk in different industrial sectors. Operational risk is explained in light of concepts given by The Basel Committee and the British Bankers Association.

Results indicate that the financial performance of the telecommunication organization is significantly influenced by operational risk. The direction of the relationship is negative, suggesting an increased operational risk deteriorates financial performance.

Though the research was able to identify significant relationships of operational risk with a firm’s financial performance, it can also be used as the basis for future studies that aim to explore the corresponding impact of operational risk on other dimensions of telecommunication industries. As explained earlier, operational losses can have many serious consequences for telecommunication companies. Apart from catastrophic examples, many other examples such as loss of key management personnel, frauds, system breakdowns, inappropriate processes, legal fines, etc. are prevalent in the telecommunication sector of Pakistan. Operational failure of telecommunication companies can have serious consequences for other companies belonging to different sectors that rely on telecoms for the quick flow of information and connectivity.
References


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Hudson, H. E. (2013). From rural village to global village: Telecommunications for development in the information age, 22(6), 59-72


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Determinants of Militancy and its Effects on Education in Districts Mohmand of Khyber Pakhtunkhwa, Pakistan

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**ARTICLE DETAILS**

**Purpose:** The main objective of this study is to investigate the determinants of militancy and its effect on education in terms of students’ dropout in District Mohmand of Khyber Pakhtunkhwa, Pakistan, in 2018-19.

**Methodology:** The review depends on essential information and a sum of 358 families has been acquired through the Yamane Formula. The information has been investigated through the Chi-Square test just as the Multiple Linear Regression Model by means of SPSS programming.

**Findings:** The chi-square experimental outcome observed a critical relationship between understudies exiting and diverse financial variables, to be specific militancy, pay, early marriage, family size, schooling, and family framework. The impact of militancy was additionally seen after disaggregation of information into male and female and revealed a high impact in females contrasted with their male partners. Assessed relapse examination shows that understudy dropout is emphatically connected with the distance of respondents' homes to the nearest school, family size, militancy and family system.

**Implications:** The review prescribes that the public authority needs to control the Pak-Afghan line and spotlight on the decrease of destitution, work on the monetary turn of events, and increment the instructive spending plan.

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**Keywords**
Militancy, Drop out, Education, Early marriage, family size, Distance from School

**JEL Classification**
C1, C5, K1, K5


**Introduction**
Militancy indicates a development where a group of people is occupied in the equipped battle to accomplish a target and subsequently hold a forceful disposition supporting a demeanor or cause
(Antonio Casses, 2006). Pakistan faces extensive instructive issues, including restricted admittance, lower education rates, and enormous provincial contrasts. Orientation separation, absence of gifted educators, and terrible school framework are only a couple of the critical purposes behind the country's poor instructive status (Shabir Hyder, Naeem Akram, and Ihtsham Ul Haq Padda, 2015; Ullah & Muhammad, 2020). Pakistan is one of the creating scene countries confronting genuine aggressiveness chances. The nation has seen numerous sorts of aggressiveness. Revolutionary gatherings utilize various methodologies to scare society to authorize their plan (Rizvi, 2005). The recently blended regions Ex. FATA individuals are the ones who stand the weight of the contention in the district. The militant has mercifully butchered many individuals, including ladies and kids. Schools were exploded, and ancestral seniors were unpredictably focused on (Ahmad et al., 2012). The nearby individuals have been driven away from their homes. Security powers are handling the danger and forfeiting their lives in a recently consolidated locale to resuscitate the instructive framework. The assailants were prohibiting schooling nearby, especially female training in the region (Ali, 2008).

The absence of admittance to quality schooling brings about provincial masses being poor in usefulness. Instructive administrations in rustic and metropolitan regions are generally isolated. To accomplish a huge extent of the provincial populace to add to a country's financial development and for the rustic populace to have equivalent open doors for quality instruction (Maxwell et al., 2001). Instruction in real essence frees a general public from odd notions, ingraining practical people's mentality and answers for the advanced world. Instructive professionals focused on the significance of cultivating the voices of helpless pieces of society that could guarantee their incorporation into standard schooling (Vanessa Andreotti and Mario T. M. de Souza 2008). The overview was led mutually by UNICEF and the Government of Pakistan in 2000, and they characterized dropout as the withdrawal of youngsters from school at any level prior to finishing essential training. They proceed to say that "nonconformist" is an expression used to depict students who leave school prior to finishing a predefined level of instruction for reasons unknown (Umoh, 1986). After reliable assaults, numerous kids were rejected by their folks from schools. The instruction foundation was shut for one to two years on account of the assailant bunch. Afghan Commission for Human Rights reports that in 2006-2008 the number of understudies diminished, i.e., simply 10.52 percent for young ladies and 8.0 percent for young men going to the schools. The high uncertainty and understudies were straightforwardly connected with exceptionally perilous conditions. In excess of 40,000 youngsters were being taboo from schools toward the finish of 2009 because of assaults on training foundations and the annihilation of schools.

The research gap of this study is that no specific work has been done to decide the impact of militancy and other financial determinants on student dropout in district Mohmand. The major objective of this study is to explore the determinants of militancy and its effect on education in terms of students’ dropping out in the study area.

Materials and Methods

Universe of the Study
The Province Khyber Pakhtunkhwa of Pakistan by and large and recent Ex. FATA organizations which are presently recently blended Khyber Pakhtunkhwa regions were extensively impacted by the twisting of aggressiveness. Enormous scope pulverization occurred in many pieces of Khyber Pakhtunkhwa. Keeping in view, the need to cover the reasons for aggressiveness and its impact based on instruction in more extensive conditions, the current review inspected reasons for militancy and its impact on schooling in ancestral region Mohmand. All the current seven tehsils of locale Mohmand comprise the universe of the review. The principal purpose for the determination of this region is that numerous instructive organizations were impacted during the twisting of militancy in region Mohmand.

Sampling Procedure
The current review took on multi-stage inspecting. In the primary stage, District Mohmand was chosen. In the subsequent stage, three tehsils, to be specific tehsil Safi, Halimzai, and Yaka Ghund among seven
tehsils were chosen in the review region. In the third stage, two towns were haphazardly chosen from each tehsil, be specific Masood and Gurbaz from tehsil Safi, Sultan Khel, and Baro Khel from Halimizai and Aqra Dag and Sroo Kaly were chosen from Yaka Ghund in the review region. In the fourth stage, various families were arbitrarily chosen from chosen towns in the review region for information assortment.

**Sample Size**

The absolute family number in the chosen towns of region Mohmand was 3477. Yamane equation (1967). The room forgiving and take was 0.05. The Formula is given beneath:

\[ n = \frac{N}{1+N(e)^2} \]  

(1)


Where \( n \) is the example size, \( N \) is the absolute populace size, and \( e \) is the mistake level of accuracy. Placing the given qualities in the above equation, the example size was assessed.

\[ n = \frac{3477}{1+3477(0.05)^2} = 358 \]  

(2)

In the wake of assessing test size, the corresponding designation technique was utilized to additionally circulate test size among the chosen towns.

The extent designation recipe is composed as:

\[ n_i = \frac{N_i}{N} \times n \]  

(3)

Where:

- \( N \) = Total Population of sampled respondents.
- \( N_i \) = Total population of respondents in each selected village.
- \( n \) = Total number of respondents selected in the study area.
- \( n_i \) = Total number of sampled respondents from each village.

Table 1: Total and sample from selected households in the study area.

<table>
<thead>
<tr>
<th>Name of selected villages</th>
<th>Number of households</th>
<th>Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Masood</td>
<td>298</td>
<td>30</td>
</tr>
<tr>
<td>Gurbaz</td>
<td>378</td>
<td>38</td>
</tr>
<tr>
<td>Sultan Khel</td>
<td>237</td>
<td>24</td>
</tr>
<tr>
<td>Baro Khel</td>
<td>1431</td>
<td>143</td>
</tr>
<tr>
<td>Aqra Dag</td>
<td>532</td>
<td>53</td>
</tr>
<tr>
<td>Sroo Kaly</td>
<td>601</td>
<td>70</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>3477</strong></td>
<td><strong>358</strong></td>
</tr>
</tbody>
</table>

Source: Survey (2018)

**Multiple Linear Regression Model and its Specification**

The numerous Linear Regression Model was applied in this review. Its shows the connection between the reliant variable (Student Dropout) and informative factors i.e Income of family head, training of family head, Distant of the respondant to the closest school, Family size, Militancy, Early marriage, Gender of Household Head, and Family System. The review was guided with the objective to break down the impact of militancy on instruction. Saqib and Ahmad (2014) were taken on for dissecting the impact of aggressiveness on instruction.

The general form of the model as;
The above functional form can be specifically written as below;

\[ Y_i = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 D_1 + \beta_6 D_2 + \beta_7 D_3 + \beta_8 D_4 + \varepsilon_i \ldots (3.6) \]

Where,

- \( Y_i \) = Number of students dropped out from school
- \( X_1 \) = Income of household (Rs monthly)
- \( X_2 \) = Education of household head (in Years)
- \( X_3 \) = Distance of respondent’s home to nearest school (in Km)
- \( X_4 \) = Household size (in Numbers)
- \( D_1 \) = Militancy, \((D_1) = 1, \text{ if any household members dropout from School, due to any type of militant activity, 0 otherwise})
- \( D_2 \) = Early marriage, \((D_1) = 1, \text{ if household members dropout from School due to early marriage system, 0 otherwise})
- \( D_3 \) = Gender of the Household head \((D_1) = 1, \text{ if household head is male, 0 otherwise})
- \( D_4 \) = Family system, \((D_1) = 1, \text{ if joint and, 0 otherwise})
- \( \varepsilon_i \) = is the random variable which consists of those factors (Other than variables considered) which affect the dependent variable.

**Results and Discussion**

This part is connected Chi-square test and Multiple Leaner Regression Model, which was assessed to decide the impact of militancy and other financial determinants on understudies exited in the review region.

<p>| Table 2: Association between Students Drops Out with Different Variables in the Study Area |
|-----------------------------------------------|-----------------|-----------------|-----------------|-----------------|</p>
<table>
<thead>
<tr>
<th>Independent variable</th>
<th>Dependent variables</th>
<th>Chi-square value</th>
<th>P-value</th>
<th>Gamma</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Militancy</td>
<td>Students Dropout</td>
<td>70.538</td>
<td>.000</td>
<td>.762</td>
<td>.000</td>
</tr>
<tr>
<td>Income</td>
<td>Students Dropout</td>
<td>91.484</td>
<td>.000</td>
<td>-.686</td>
<td>.000</td>
</tr>
<tr>
<td>Early marriage</td>
<td>Students Dropout</td>
<td>15.026</td>
<td>.001</td>
<td>.399</td>
<td>.000</td>
</tr>
<tr>
<td>Family Size</td>
<td>Students Dropout</td>
<td>48.356</td>
<td>.000</td>
<td>.224</td>
<td>.002</td>
</tr>
<tr>
<td>Distance</td>
<td>Students Dropout</td>
<td>54.959</td>
<td>.000</td>
<td>.485</td>
<td>.000</td>
</tr>
<tr>
<td>Education</td>
<td>Students Dropout</td>
<td>40.473</td>
<td>.001</td>
<td>-.450</td>
<td>.000</td>
</tr>
<tr>
<td>Family system</td>
<td>Students Dropout</td>
<td>24.361</td>
<td>.000</td>
<td>.506</td>
<td>.000</td>
</tr>
</tbody>
</table>

Source: Field Survey, 2019

**Association between Students Drops Out with Different Variables in the Study Area**

The Chi-Square Test of Independence investigates whether absolute factors are related (i.e., regardless of whether the factors are free or related). It is a nonparametric test. Table 1 shows the relationship among aggressiveness and other financial determinates on understudy dropout in the review region. Results uncover that free factors like hostility, early relationships, family size, distance, and the family framework had a p-esteem is 0.000 which is under 0.05, and its shows a profoundly huge relationship between the reliant and autonomous factors and gamma shows a positive heading. Notwithstanding, the
relationship among pay and schooling of the family head was likewise seen as critical with a p-value of 0.001 which is under 0.05 and gamma shows a backward bearing. The accompanying outcome is with the line (Christine et al., 2007). The Chi-Square test uncovered a connection between destitution, an association of young ladies' kids in housework/cultivating, strict training of young ladies, early relationships of female understudies, absence of kids' advantage, hostility, and elementary school dropout of young ladies’ understudies.

Table 3: Effect of Militancy on Male Students Dropout in the Study Area

<table>
<thead>
<tr>
<th>Militancy</th>
<th>Number of Male Students Dropout</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1-3</td>
<td>4-6</td>
</tr>
<tr>
<td>Yes</td>
<td>26</td>
<td>49</td>
</tr>
<tr>
<td>No</td>
<td>76</td>
<td>57</td>
</tr>
<tr>
<td>Total</td>
<td>102</td>
<td>106</td>
</tr>
</tbody>
</table>

Source: Field survey, 2019

Chi-Square=17.13 P-Value=0.000

Effect of Militancy on Male Students Dropout

Table 3 shows the relationship between militancy and male understudies exiting in the review region. The chi-square worth is 17.13 and the p-value is 0.000, which is extremely low at a .05 percent level, showing a solid relationship between the two factors. It shows that there is a solid relationship between aggressiveness and understudies’ dropout in the review region.

Table 4: Effect of Militancy on Female Students Dropout in the Study Area

<table>
<thead>
<tr>
<th>Militancy</th>
<th>Number of Female Students Dropout</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1-3</td>
<td>4-6</td>
</tr>
<tr>
<td>Yes</td>
<td>66</td>
<td>40</td>
</tr>
<tr>
<td>No</td>
<td>48</td>
<td>171</td>
</tr>
<tr>
<td>Total</td>
<td>114</td>
<td>211</td>
</tr>
</tbody>
</table>

Source: Field survey, 2019

Chi-Square = 58.63 p-value=0.000

Effect of Militancy on Female Students Dropout

Table 4 shows the relationship between militancy and female understudies dropping out in the review region. Where the Chi-Square worth is 58.63 and p-esteem is 0.000, which is under 0.05 percent level, demonstrating a solid relationship between the two factors.

Linear Regression Model and its Assumptions used in the Study

Factual examinations depend on suppositions about the factors that will be inspected. The outcomes may not be solid in the event that specific presumptions are not met. Since it is absolutely impossible to decide whether the measurable tests' presumptions were met or not, not assessing the suspicions prompts issues in regards to the legitimacy of these models’ decisions. Prior to deciphering the model's decision, different suspicions about numerous relapses should be tended to. Multicollinearity, heteroscedasticity, and ordinariness are the presumptions of (OLS) Odeneray Least Square (Jason, 2002).

Table 5: Variables: fitted values of Students Dropout

<table>
<thead>
<tr>
<th>Chi2(1)</th>
<th>Prob &gt; chi2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.11</td>
<td>0.2922</td>
</tr>
</tbody>
</table>

Estimation of Breusch-Pagan test to check the Heteroscedasticity for Student drop out

Table 5 demonstrates the assessed worth of the Breusch-Pagan test to check the issue of heteroscedasticity and it is utilized for enormous example size. The outcome shows that the p-esteem is more noteworthy than 0.05; thus we acknowledge the invalid theory of homoscedasticity; henceforth no rate of heteroscedasticity in the information.
Heteroscedasticity test  

Ho: There is no Heteroscedasticity (constant variance)  

H1: There is Heteroscedasticity (constant variance) 

<table>
<thead>
<tr>
<th>Variable</th>
<th>Observation</th>
<th>W</th>
<th>Z test</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standardized Residual for Student drop out</td>
<td>358</td>
<td>0.99333</td>
<td>1.205</td>
<td>0.11419</td>
</tr>
</tbody>
</table>

**Source:** Field Survey, 2019

**Shapiro-Wilk test for Normality**

Prior to assessing the impact of aggressiveness on understudies' dropout, it is important to check the ordinariness of the factors utilized in the relapse model. Shapiro-Wilk test has been utilized to check the ordinariness of the illustrative factors, which shows the conveyance of information of various factors (understudies quitter, the pay of family head, instruction, distance, family size, aggressiveness, early marriage, orientation of family head, family framework) are regularly appropriated or not. The hypotheses for the test are

Hypotheses:  
H0: Variable are not normally distributed  
H1: Variable are normally distributed

The p-value as shown in table 5, is greater than 0.05; hence we accept the alternative and reject the null hypothesis. The alternative hypothesis states that the data is normally distributed.

**Table 7: VIF and Tolerance tests of Multicollinearity**

<table>
<thead>
<tr>
<th>Explanatory Variables of the Model</th>
<th>Variables</th>
<th>Tolerance</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Income of Households (Rs)</td>
<td>.826</td>
<td>1.210</td>
<td></td>
</tr>
<tr>
<td>Education of Household Head (Year)</td>
<td>.888</td>
<td>1.126</td>
<td></td>
</tr>
<tr>
<td>Distance of Respondent Home to Nearest School (Km)</td>
<td>.825</td>
<td>1.213</td>
<td></td>
</tr>
<tr>
<td>Family Size (Number)</td>
<td>.963</td>
<td>1.038</td>
<td></td>
</tr>
<tr>
<td>Militancy (Dummy)</td>
<td>.761</td>
<td>1.314</td>
<td></td>
</tr>
<tr>
<td>Early Marriage (Dummy)</td>
<td>.863</td>
<td>1.159</td>
<td></td>
</tr>
<tr>
<td>Gender of Household Head (Dummy)</td>
<td>.886</td>
<td>1.129</td>
<td></td>
</tr>
<tr>
<td>Family System (Dummy)</td>
<td>.788</td>
<td>1.269</td>
<td></td>
</tr>
</tbody>
</table>

**Source:** Field survey, 2019

**Diagnostic Test for Multicollinearity**

The aftereffects of the fluctuation expansion element and resistance tests for multicollinearity are displayed in Table 6. While resilience is the unaccounted-for level of variety in the autonomous variable, the other free factor, i.e., 1-R2, and difference expansion, is proportional to resistance. The difference expansion factor (VIF) upsides of all illustrative factors in this exploration study were under 5, showing that the recommended model doesn't disapprove of multicollinearity.

**Standardized Residual to Estimate the Effect of Socio-economic Determinants on student dropout in the study area.**

Figure 1 shows the bell-shaped curve histogram, which indicates that the data is normally distributed.
Table 8: Regression Analysis of Students Dropout from School

<table>
<thead>
<tr>
<th>Explanatory Variables</th>
<th>Unstandardized Coefficients</th>
<th>T</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td>2.297</td>
<td>.342</td>
<td>6.722</td>
</tr>
<tr>
<td>Income of Households (Rs monthly)</td>
<td>-6.161</td>
<td>.000</td>
<td>-8.991</td>
</tr>
<tr>
<td>Education of Household Head (in Years)</td>
<td>-.048</td>
<td>.019</td>
<td>-2.521</td>
</tr>
<tr>
<td>Distance of Respondent Home to Nearest School (in Km)</td>
<td>.184</td>
<td>.070</td>
<td>2.635</td>
</tr>
<tr>
<td>Family Size (in Number)</td>
<td>.093</td>
<td>.025</td>
<td>3.704</td>
</tr>
<tr>
<td>Militancy (D1 = 1, household member dropout due to militancy, 0 otherwise)</td>
<td>.508</td>
<td>.124</td>
<td>4.092</td>
</tr>
<tr>
<td>Early Marriage (D2 = 1, if member dropout from school due to E.M, 0 otherwise)</td>
<td>.285</td>
<td>.122</td>
<td>2.329</td>
</tr>
<tr>
<td>Gender of Household Head (D3 = 1 male, 0,otherwise)</td>
<td>.039</td>
<td>.138</td>
<td>.287</td>
</tr>
<tr>
<td>Family System (D4 = joint, 0 otherwise)</td>
<td>.271</td>
<td>.123</td>
<td>2.211</td>
</tr>
<tr>
<td>R² = 0.435</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F-stat = 34.324</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Dependent variable i.e Student dropout

Multiple Regression Model was used to Estimate the Effect of Socio-Economic Determinants on Student Dropout in the Study Area

Table 8 exhibits the extended consequence of the numerous direct relapse model. The R² esteem was 0.43, which demonstrates that 43% of varieties in the reliant variable were explained by the logical factors contained in the model. The F measurement esteem was 34.32, which is bigger than the standard worth (0.05), which shows that the general model was critical, with a p-esteem (0.000).

Assessed Result of the Regression model of the understudies exiting with various factors. As indicated by the table, the coefficient of family head pay is - 6.16 and it is exceptionally huge (0.000) at a 5
percent importance level. The relationship shows that assuming different factors are kept consistent when one-rupee expansion in the pay of family head causes a diminishing in the quantity of understudy dropout by 6.16. The outcomes demonstrated a negative connection between family pay and understudy dropout. The coefficient of family head's schooling is - .048, which is huge (0.012) at a 5 percent importance level. The outcome shows a negative connection between household’s head education level and students drop out. A one-year expansion in family head training causes an abatement in the understudy dropout by 0.048. The outcome shows that there is a negative connection between family head schooling and understudy dropout. The coefficient of distance from the closest school is 0.184, which is critical at 5%. The outcome shows a positive connection between understudy dropout and distance from home to the closest school, and it likewise shows that assuming the one-kilometer expansion in distance causes an increment in the understudy dropout by 0.184. The outcome shows a positive connection between distance from the closest school and understudies drop out in the event that different factors are kept steady. The coefficient of Family Size is 0.093, and it is critical at 5%. The outcome shows a positive connection between family size and understudy dropout rate. The assessed aftereffects of the table show the coefficient of early marriage, which is 0.285. It is huge at 5%. The outcome demonstrates a positive connection between early marriage and understudy dropout. It additionally shows that one-year expansions in the early marriage, understudies drop out has expanded by 0.285. The outcome shows a positive relation between early marriage and understudy dropout in the review region. The coefficient of the orientation of the family head is 0.039, which is huge at 5%, it demonstrates that there is a positive connection between understudy dropout and orientation of the family heads. At the point when one individual of the male of the family head has expanded, the understudies drop out have expanded by 0.039 in the review region. The outcome shows that there is a positive connection between family size and understudy dropout. The assessed Result of the Regression model shows that the coefficient of aggressiveness is 0.508, which is profoundly huge at 5%. In the event that different factors are kept consistent, militancy causes a 0.508 percent change in understudy dropout. The outcomes demonstrated that there is a positive connection between aggressiveness and understudy dropout.

As we have different illustrative factors in the model subsequently the normalized coefficient (Beta) showed the overall significance of every autonomous variable, it was seen that among every single logical variable, Militancy (M) with a beta worth (0.508) highly affects subordinate variable which is the quantity of understudies’ quitter and that was profoundly attractive. Any remaining factors i.e., pay, schooling, distance, family size, early marriage, and family framework were additionally found to have a critical relationship with the reliant variable rather than the orientation of the family head found to have an inconsequential relationship with the reliant variable is barred from the model during the examination. The accompanying outcomes are equivalent to the finding of Collins (2009) by Using numerous relapse examinations; it was resolved that aggressiveness, training of family head, family size, Distance from school, and family framework were the factors that are bound to foresee higher dropout rates among understudies. Moreover, unstandardized coefficients from the various relapse investigation uncovered that these autonomous factors enormously affected understudy dropout.

Conclusions and Recommendations
This concentrate on at long last inferred that to decide the impact of militancy and other financial
The Chi-square experimental outcome further demonstrates the relationship between various factors with understudy dropout in the review region. Results uncover that every one of the factors like hostility, pay, early relationships, family size, distance, training, and the family framework had a profoundly critical and positive relationship with the understudies exiting in the review region. Numerous straight relapse model (MLRM) was utilized to examine the relationship between subordinate variable i.e., understudies’ dropout, and informative factors i.e., hostility, the pay of family head, instruction of family head, the distance of respondents from home to the closest school, family size, early relationships, the orientation of the family head and family framework. It was seen that every one of the illustrative factors was found with a huge positive relationship aside from pay and Education of family head. Unstandardized coefficient esteems show that the greatest impact on understudy dropout was seen on account of militancy.

- Educational institutes should be provided with strong security to assure the safety of students.
- More budget should be allocated to the education sector to meet the demand for quality education.
- To encourage female students, needy students should be provided with scholarships and financial aid.
- Promote gender equality and female education through an awareness campaign in the light of the Holy Quran and Sunnah.
- The government should take steps to ensure that education services are available during times of conflict and disaster so that an individual’s education is not disrupted.

References
Business Incubators in Pakistan: State of the Art and Future Outlook

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ABSTRACT

Purpose: In developing countries business incubators (BIs) have become a key catalyst for the flourishment of new ventures, due to overall weak financial health and opportunities for the startups. The purpose of this research is to evaluate the effectiveness of BIs in Pakistan and identify areas that need improvement.

Design/Methodology/Approach: The study adopts a mixed-method approach of social science research, using a cross-sectional survey of BI tenants in Pakistan (n=100), triangulated with the help of in-depth interviews of key stakeholders of BIs (n=12). Data from cross-sectional survey were analyzed using descriptive statistics and Paired Samples T-test methods. Data from interview responses were analyzed with the help of MAXQDA.

Findings: The study shows that the effectiveness of incubation facilities in Pakistan is less than the perceived importance and identifies which facilities tenants are most and least satisfied with. The findings of this study suggest that for BIs to be more effective in creating new ventures and providing employment opportunities, the Pakistani government must take concrete actions. New BI centers must be established to meet the market's demands and an evaluation process for existing BI centers must be implemented. To aid in the creation of new businesses in Pakistan, more university-based BIs should be established.

Implications/Originality/Value: The findings of this study are equally useful for the Government of Pakistan, BIs, and fresh startups.

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Introduction
The economy of most developing countries is weak, and they are heavily reliant on borrowing money from other countries to meet their financial obligations. Pakistan is not an exception to this rule. Because of a lack of investment, Pakistan's economy has been in shambles for more than two decades. The
country's financial situation necessitates the implementation of effective policies and actions pertaining to business activities and job creation (Shafi, Liu, & Ren, 2020). Small and medium-sized enterprises (SMEs) are widely regarded as the backbone of a developing economy (Lu, Wu, Peng, & Lu, 2020). In developing countries, on the other hand, the survival rate of new businesses is extremely low (Hyder & Lussier, 2016). The majority of business ventures in troubled economies fail in their infancy or very early stages. A startup's most critical support is considered to be business incubation, which is especially important in developing countries that lack the necessary administrative and financial infrastructure to support businesses in their early stages (Shahzad, Bajwa, Ali, & Zia, 2012).

Business incubators (BIs) serve as a safety net for start-up companies whose founders may not be able to afford the initial startup costs. To put it another way, when business owners are active and productive, they appreciate having BIs on their team. Business incubators provide a wide range of administrative and managerial services in order to create an environment that encourages the growth of new businesses. Because they are unable to afford these resources, the infants consider them to be luxurious. Businesses in the early stages of development strive to minimise the failure aspects of new ventures, such as a lack of information about the target market, an inability to withstand a massive capital loss, an inability to provide administrative services, management assistance, and so on (Yasin, Khansari, & Tirmizi, 2021).

BIs (business incubators) are being investigated in Pakistan, and the purpose of this study is to determine their effectiveness. BIs provide facilities and appropriate support to new businesses in order to increase their chances of surviving (Hassan, 2020). As a result, the purpose of this study is to identify the most effective facilities that BIs in Pakistan provide to their tenants as well as to identify potential areas for future improvement. The findings of this study assist BIs in determining which services they are providing well and which services they need to improve on. It is hoped that the empirical evidence from this study will assist business incubators (BIs) and policymakers in Pakistan and other developing countries in developing and implementing more concrete initiatives to accelerate the incubation process and encourage more startups to register.

**Business Incubators: Definition and History**

There is no consensus among researchers on what constitutes business incubation. There are numerous descriptions of business incubation in the literature, but none of them are universally applicable (Hamdani, 2006). Business incubators (BIs) are organizations that provide a variety of essential resources to help start-ups and growing companies thrive, as well as organizations that are based locally to promote and assist new business ventures in their early stages, according to some definitions (Hackett & Dilts, 2004). While other definitions of business incubators (BIs) emphasize the BIs' entrepreneurial qualities, the goal of establishing business incubators is to encourage entrepreneurship and, as a result, to aid in economic development. With this definition, business incubators have been unable to support technical entrepreneurs and the establishment of new businesses (Hackett & Dilts, 2004).

Described by the United Kingdom Business Incubator (UKBI) as "a nurturing, instructive, and supportive environment for entrepreneurs during the critical stages of starting a new company," business incubation is "a nurturing, instructive, and supportive environment for entrepreneurs during the critical stages of starting a new company." An incubator's primary goal is to increase the likelihood of a startup's success while simultaneously shortening the time and lowering the cost of establishing and growing its business. "If successful, business incubators can assist in the development of companies that will serve as the true creators of a region's or nation's future wealth and employment opportunities" (Voisey et al., 2006, p21). In the United States and Europe, the origins of business interruptions can be traced back to the mid-twentieth century, during the rise of unemployment and the economic slump in the two countries. Beginning in the late 1970s and early 1980s, Western industrialized countries began establishing BIs to combat poverty (European Commission, Center for Strategy & Evaluation Services, 2002).
Bhabra-Remedios and Cornelius (2003) examined the historical development of the concept of business incubation and asserted that it was first established in Batavia, Illinois, in 1959, according to their research. This concept was developed through collaboration between governments in Europe and the United States, as well as academic institutions. Growth was slow during the 1980s, despite the increased attention and expectations of the government at the time. Within two decades, the number of incubation centers and the businesses that they supported continued to grow at a steady pace. The public's understanding of the importance of a business incubation center has grown significantly, as has the significance of such a center. Historically, it is believed that the roots of incubation centres can be traced back to the development of managed workstations and creativity centres in the United Kingdom during the 1970s and 1980s (Atherton & Hannon, 2006). (2006); (Atherton & Hannon, 2006; There were 12 incubators in the United States in 1980; by 1984, the number had increased to approximately 20 per year, and by 1987, the number had increased to approximately 70.

A robust real estate factor, proximity to research institutes or technical university environments (e.g., industrial complexes), and proximity to research institutes or technical university environments (e.g., industrial complexes) are all characteristics of first generation incubators. Science, knowledge parks, and techno poles are examples of first generation incubators (Bruneel, Ratinho, Clarysse, & Groen, 2012). Because of the significant public investments made in their real estate components over time, they are sometimes bolstered by national or local programmes for invention, job creation, and financial development. It is referred to as the "second generation" of incubators when simulated incubators are used. SMEs in fields with insufficient acute physique are likely to benefit from non-property-based projects, which require lower fixed investments and are seen as a viable option for providing services to them. University or research centres frequently house these incubators, which are distinguished by their ability to function both inside and outside the walls of the building. Working as "incubators without walls," they assist new ventures in getting off the ground without requiring them to remain in the incubator's facilities for an extended period of time.

International business incubators are considered to be of the "third generation." They provide a comprehensive set of support services to help knowledge-based businesses grow and succeed in their respective industries. The majority of them are based on exports and have demonstrated exceptional growth rates as well as sales records. It is through them that universities, research institutes, venture capital, and international joint ventures are connected. In China, Korea, and Malaysia, this type of incubation, which is based on the intersection of support tools, is already in operation (Li, 2013). Some of these incubators are currently working to establish Incubator Nets, which are networks of incubators that are located in the same region, country, or have a similar focus to their own. Dot.com incubators showcase a model with distinguishing characteristics (Shepard, 2017). It is a relatively new but well-known portent in advanced markets, particularly the United States, that dot-com incubators or Internet business accelerators, which were formed as part of the "wave" of the new economy, were formed. They are distinguished by their strong project capital positioning as well as the shorter incubation periods that they have implemented (a few months instead of 2-3 years). Business incubators are a type of environment that is specifically designed for the formation of new businesses.

Business Incubation in Pakistan
In Pakistan, the concept of business incubation is still in its early stages. A business incubation centre was established in Lahore in 2006, which was the country's first such facility. There are approximately sixteen business incubators in Pakistan at the moment, six of which are women-focused and solely dedicated to the advancement of women-owned businesses (Shahzad et al., 2012). In Pakistan, the economic development of women has largely gone unnoticed. The Small and Medium Enterprise Development Authority (SMEDA) of Pakistan was the first to bring the concept of business incubators (BIs) to the country's attention (Shahzad, 2015). Some universities are also exploring the concept of
university-based incubation centres, which is still in its early stages. For example, the Faisalabad Incubation Center (TFIC) at the University of Agriculture Faisalabad and the Business Incubation Center (BIC) at the Government College University Faisalabad (GCUF) are both actively engaged in their respective fields of endeavour. Many other entrepreneurship-oriented business schools are also planning to establish centres like this to help startups and fledgling companies accelerate their successful development by providing them with a variety of targeted resources and services.

Selection and graduation procedures are in place for Pakistani BIs, just as they are for their counterparts in other countries. The incubate company will be graduated once it has met all of the requirements listed below. Incubation can last up to 18 months in the case of one of the tenants. If the project has not been completed by that time, an extension of 2-6 months may be granted for it. Tenants have met all of the objectives outlined in the business plan. This indicates that the company has either licenced its technology to a third party or devised an exit strategy that will allow it to continue operating outside of the incubator with the least amount of disruption possible. If a tenant company fails to meet the quarterly targets twice in a calendar year, the space requirement of the tenant company exceeds the capacity of the incubator space. Consider the scenario in which the review committee determines that the project is no longer viable for whatever reason. This means that the landlord will be held liable if incubate fails to comply with its obligations under the lease agreement.

Methodology
Similar to Ali, Sheikh, and Latif (2021), the study follows a two-step approach. In the first phase of the study a cross-sectional survey of 100 tenants was conducted with the help of a structured questionnaire (Hong & Lu, 2016) and in the second phase in-depth interviews of key stakeholders of BIs in Pakistan were conducted to triangulate the findings of the cross-sectional survey and to gain insights and suggestions from the stakeholders.

Phase 1: Cross-sectional Survey
During the phase one of this study the data were collected via a standardized questionnaire. The exact number of operating incubators in Pakistan was unknown at the time of the study, although 17 could be reached. Of the 17, 14 contactable incubators agreed to take part in the survey. The questionnaire was then mailed to 112 clients of the 14 participating BIs. After follow up, 100 questionnaires were submitted. The final response rate of 89% was deemed satisfactory as it was higher than the typical response rate of mail surveys (Alreck, Alreck, Settle, & Robert, 1995). We analyzed different categories of business incubation services often given by business incubators in Pakistan (Qureshi, Hassan, & Mian, 2021). Perceptions of the importance and effectiveness of these services were investigated using a five point Likert scale, similar to prior studies in the context of Pakistan (Ali, Aslam, & Hafeez, 2021; Riaz, Shahid, & Ali, 2021).

Phase 2: In-Depth Interviews
We conducted in-depth interviews with twelve respondents including managers of BIs operating in different universities of Pakistan, and other key stakeholders of BIs’ activities, in the second round, to fins their perspectives and insights about the future of business incubation in Pakistan. The respondents were selected based on their experience with business incubation process. We made certain that we only interviewed respondents who had first-hand experience of dealing with business incubation.

Interviews were done in informal settings to ensure that respondents gave their opinions freely and without hesitation (Ali & Brandl, 2018). The interviews were tape-recorded and later transcribed and translated into English (as many respondents shared their views in Urdu and Punjabi). To encapsulate the future of business incubation in Pakistan themes were produced using open coding of interview transcripts.
Results and Analysis: Phase 1
Because the purpose of this study is to evaluate the effectiveness of BIs, if the facilities/services are effectively provided and the tenants believe that they are effectively provided, the tenants will be satisfied. We are attempting to determine the level of tenant satisfaction in this section of the study because there is a direct relationship between effectiveness and tenant satisfaction. It follows that if the effectiveness is high, the satisfaction will be high, and vice versa.

Satisfaction from Infrastructural Facilities
The satisfaction level of tenants with infrastructural faculties is shown in Table 1. The mean difference, calculated using the formula (importance-effectiveness=satisfaction), represents the tenants' satisfaction. The mean difference is positive at 0.359, indicating that perceived importance is greater than perceived effectiveness, implying that tenants are less satisfied. The difference between the two measures is slightly greater, indicating that they believed infrastructure was critical to running a successful business but that the BIs did not deliver on that promise. The significance of the data is determined in the final column of the table, and the level of significance is set to five points; the result indicates that the data is significant because the value 0.002 is less than five points.

Table 1: Tenants’ Satisfaction from Infrastructural Facilities

<table>
<thead>
<tr>
<th>Paired Samples T-Test (Infrastructural Facilities)</th>
<th>Paired Differences</th>
<th>t</th>
<th>Df</th>
<th>Sig. (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Std. Deviation Std. Error Mean 95% Confidence Interval of the Difference Lower Upper</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pair 1</td>
<td>Infrastructural Facilities (Importance) - Infrastructural Facilities (Effectiveness)</td>
<td>0.359 0.609 0.104 0.146 0.571 3.437 33 0.002</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Satisfaction from Marketing Services
Tenants placed a lower premium on marketing services than the other four groups. The first column of the following table calculates the difference between two means. The significance of marketing services—the effectiveness of marketing services—equates to tenant satisfaction with marketing services. The mean difference is positive, indicating that tenants place a premium on marketing services but are not receiving them effectively. The mean difference is 0.345, which is slightly less than the mean difference for infrastructural facilities. This indicates that tenants are less satisfied with marketing services, but more satisfied with infrastructural facilities.

Satisfaction with physical infrastructure > Satisfaction with marketing services (0.359>0.345)

The final column of the table also assesses the data's significance. Because the result 0.099 is less than the set point 5, the data is statistically significant.

Table 2: Tenants’ Satisfaction from Marketing Services

<table>
<thead>
<tr>
<th>Paired Samples T-Test (Marketing Services)</th>
<th>Paired Differences</th>
<th>t</th>
<th>Df</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Satisfaction from Training Programs

Tenants are dissatisfied with training programs despite their importance. Tenants placed a higher premium on training programs than the other four groups, but the mean difference is greater than the difference between the previous two groups' infrastructural facilities and marketing services. The mean difference is 0.576, which is an unusually large value. This means that while training programs are critical, their effectiveness pales in comparison to their importance. Consider the distinctions between these three groups:

Satisfaction with Training Programs > Satisfaction with Physical Infrastructure > Satisfaction with Marketing Services (0.576>0.359>0.345)

Additionally, the data is statistically significant because the calculated value of 0.002 is less than the set point value of 5.

Table 3: Tenants’ Satisfaction from Training Programs

<table>
<thead>
<tr>
<th>Pair</th>
<th>Paired Differences</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marketing Services (Importance) - Marketing Services (Effectiveness)</td>
<td>0.576</td>
</tr>
</tbody>
</table>

Satisfaction from Networking Facilities

The fourth category of facilities is networking. Not only is this fourth in the grouping, but also fourth in importance according to the tenants. The data are statistically significant because the calculated value of 0.001 is less than the specified value of 5. The mean difference between the importance of networking and the effectiveness of networking facilities is the second most significant value in the table. The value is the greatest of the three groups previously discussed. The value is 0.715, indicating that there is a significant disparity between significance and effectiveness. The following table compares four groups:

Satisfaction with networking > Satisfaction with training programs > Satisfaction with infrastructure > Customer satisfaction with marketing services (0.715>0.576>0.359>0.345)

Table 4: Tenants’ Satisfaction from Networking Facilities

<table>
<thead>
<tr>
<th>Pair</th>
<th>Paired Differences</th>
</tr>
</thead>
<tbody>
<tr>
<td>Training Programs (Importance) - Training Programs (Effectiveness)</td>
<td>0.576</td>
</tr>
</tbody>
</table>
### Satisfaction from Consultancy Services

A consultancy service is placed as fifth group in the questionnaire but the tenants also placed it at fifth position in the satisfaction. The mean difference of importance of consultancy services and effectiveness of consultancy services is the highest in the groups of five and very near to 1. The mean difference is 0.827 which is very high. The data is statistically significant as the calculated value is less than set point 5. The value is 0.000. The equation below provides the comparison of all five groups:

\[
\text{Consultancy Services Customer Satisfaction > Satisfaction with networking > Satisfaction with training programs > Satisfaction with infrastructure facilities > Satisfaction with marketing services}
\]

**Table 5: Tenants’ Satisfaction from Consultancy Services**

<table>
<thead>
<tr>
<th>Paired Differences</th>
<th>t</th>
<th>df</th>
<th>Sig. (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Networking (Importance) - Networking (Effectiveness)</td>
<td>3.650</td>
<td>33</td>
<td>0.001</td>
</tr>
</tbody>
</table>

### Results and Analysis: Phase 2

As shown in Table 6, various tenants and BI center managers were interviewed in depth. Pakistan has few BIs that are almost all government-owned. The government should expand the number of centers because people show a positive attitude towards BIs. More business incubation centers means more opportunities for young entrepreneurs. The government should help the private sector and universities. A large number of incubation centers are required to support the economy and provide business facilities. The government cannot start them all. The fact that educated people are running businesses is a good sign for the country. The university is the best place to provide this vital opportunity to initiate their own ventures.

There should be a check and balance on the active centers’ work. Incubation depends on checks and balances. The authorities should not let the centers run free and should keep a close eye on their operations. The effectiveness of the provided facilities should be evaluated. How can the center know where they are lacking and what needs to be improved if they are not analyzing the effectiveness of the provided facilities?
It should be evaluated how many tenants come to the center and how many leave. The evaluation process can show the centers’ performance better. BIs should attract people who want to start a business and have a plan. If people do not know about BIs and how they work, management should educate them by holding seminars and visiting universities. Because BIs are unknown, nationwide marketing and advertising is required.

Table 6: Categories of Interview Responses

<table>
<thead>
<tr>
<th>Category</th>
<th>Sample Response</th>
<th>Respondent</th>
</tr>
</thead>
<tbody>
<tr>
<td>State of the art</td>
<td>“BI’s purpose is not just to provide some infrastructural facilities like building and prime location as almost every BIs is providing, it is also necessary to give some attention to some other facilities like meeting rooms, cafeteria and internet connection.”</td>
<td>R-11, AT</td>
</tr>
<tr>
<td>Identity issues</td>
<td>“Tenants conduct business in the BIs just as they would in the shell. There is very little interaction with the outside world. For example, if a business owner wishes for potential customers to learn about it, he must place a business name sign to attract attention and inform people that he has the item or service that they may require. However, tenants are not permitted to place that sign outside the provided building. The management must conduct an investigation into this matter.”</td>
<td>R-3, AT</td>
</tr>
<tr>
<td>Development issues</td>
<td>“There are some training programs available on a general basis, but very few on a customized basis. Every business faces different difficulties and challenges, so BI should provide tailored training to each tenant based on these challenges.”</td>
<td>R-1, AM</td>
</tr>
<tr>
<td>Professional assistance</td>
<td>“BIs should provide access to and instruction in the use of current accounting applications.”</td>
<td>R-5, AM</td>
</tr>
<tr>
<td></td>
<td>“The management of BIs should train their employees on a regular basis in modern management techniques so that they can better provide services and facilities.”</td>
<td>R-2, AM</td>
</tr>
<tr>
<td>Behavioral side</td>
<td>“Managers need to know their tenants well and be approachable and proactive when dealing with them.”</td>
<td>R-7, AM</td>
</tr>
<tr>
<td>Eco-system</td>
<td>“BIs should work with other players in an ecosystem rather than playing alone; in this way they will be better able in filling the gap between perceived importance and perceived effectiveness.”</td>
<td>R-9, AM</td>
</tr>
<tr>
<td>Isomorphism, Benchmarking</td>
<td>Some BIs are unable to play an effective role because they copy what is successful elsewhere; however, it is possible that what is successful elsewhere is not suitable for you; therefore, each BI should tailor its policy to its own market and tenants' needs.</td>
<td>R-4, AM</td>
</tr>
<tr>
<td>Availability, opportunity</td>
<td>“In Pakistan, there are only a few BIs, all of which are almost entirely government-run. Because there is a positive attitude toward these centers, the government should increase the number of centers. More business incubators mean more opportunities for entrepreneurs to start their own businesses.”</td>
<td>R-12, AT</td>
</tr>
<tr>
<td>University BIs</td>
<td>“University-based business incubators can be very effective in stimulating young business graduates to start new ventures, which is a good sign for the country that educated people are running businesses. The young and educated are always eager to try new things and take risks in order to succeed; the university is the best place to give them this crucial opportunity to start their own businesses.”</td>
<td>R-8, AM</td>
</tr>
</tbody>
</table>

Source: Authors’ own classification
R=Respondent, AT=Anonymous Tenant, AM=Anonymous Manager (BI Center)

Analysis of Results and Future Outlook

The role of BIs in fostering entrepreneurial activity cannot be overstated (Khorsheed, Al-Fawzan, & Al-Hargan, 2014). There is a mismatch between the perceived importance and the actual effectiveness of BIs in providing services to their facilities. BIs purpose is not just to provide some infrastructural facilities like building and prime location as almost every BIs is providing. There was a growing sense of dissatisfaction among tenants due to the lack of modern facilities like internet facilities, which are essential for connecting with the outside world in today's globalized economy.
Tenants are doing business in the BIs like in the shell. The interaction with the outside world is very limited. For example, if you want potential customers to know about your business, you should put up some sort of business name sign to draw attention to it and inform passersby that you provide the product or service they seek. Although this name board may be placed outside of the provided building, tenants are prohibited from doing so. There are a few generic training courses available, but the number of tailored courses is much smaller. Every business face different kind of difficulties and challenges, so according to these challenges BI should provide customized trainings to every tenant (Peters, Rice, & Sundararajan, 2004). BIs should provide training and facility of using modern accounting software. BIs management team must be aware of market needs and every team member know his character in incubation process.

BIs management should also provide training to their staff on periodical basis about the modern management techniques; they will be better able to provide facilities and services (Schwartz & Hornych, 2008). Managers need to know their tenants well and be approachable and proactive when dealing with them. BIs should work with other players in an ecosystem rather than playing alone; in this way they will be better able in filling the gap between perceived importance and perceived effectiveness. This may not be appropriate for you, so it is important that every BI tailors its policies in accordance with the needs of its own market and tenants rather than simply copying what other BIs are doing successfully (Gstraunthaler, 2010). There are very few BIs in Pakistan and most of them are government owned. Government should increase the number of centers because there is positive attitude towards these centers. More business incubators mean more opportunities to start up business.

Government should take some initiatives to indulge the private sector and universities. In order to support the economy by providing business facilities, the private sector must be enticed by incentives to establish more incubation centers, which is nearly impossible for the government to initiate across the country. University based business incubation centers can play very effective role to create new ventures by stimulating the young business graduates it will be healthy sign for the country that educated folks are running businesses. The university is the best place to give the young and educated the opportunity to start their own ventures and do something different. They are always eager to do something different (Guerrero, Urbano, & Gajón, 2020).

The active centers should be subject to checks and balances to ensure that they are operating as intended. The success of incubation is depending upon the check and balance. The road to the failure of BIs will undoubtedly lead to the authorities letting the centers run free and not keeping a close eye on how they are working. Analysis should be conducted about the effectiveness of the provided facilities. If the center is not analyzing effectiveness of the provided facilities how they can come to know where they are lacking and what needs to improve to get better results. Evaluation should be conducted about how many tenants are coming to the center and how many departs with success or failure. Evaluation process can portrait a better picture about the performance of the centers (Shahzad et al., 2012). A BI's goal should be to draw in those who are eager to start their own business and already have a game plan in place. If the people don’t know about the BIs and there working how they will took advantage of the working of BIs, the management should attract the people by carrying some seminars and by visiting universities to educate people. Because so few people are aware of BIs, they need to be promoted and advertised across the country.

**Conclusion**

The concept of business incubation is not as developed in Pakistan as it is in European countries, as a result, only a few business incubation centers operate in the country; the study's major limitation is the small sample size. Due to the fact that these centers are located throughout the country, it is extremely difficult to contact and approach all tenants associated with these incubators, as they are not always available in the center; in order to run the business, they must perform some work outside the center. In Pakistan, the response rate is low; people are hesitant to respond, which makes data collection difficult.
The purpose of this study was to determine the effectiveness of incubators, tenant satisfaction, and the role of business incubators in the creation of new ventures in Pakistan. In this regard, the study focused exclusively on the BIs tenants and the stakeholders who have direct impact on the incubation process and the creation of new ventures.

It is impossible to overstate the importance of BIs in fostering entrepreneurial activity. However, there is a mismatch between the perceived importance of business intelligence and its actual effectiveness in providing services to its facilities. Through incubation programs, BIs nurture entrepreneurs and their ventures by providing a variety of facilities and services. Thus, these mechanisms contribute to Pakistani start-ups' success. Tenants view this as a highly effective method of conducting business with the assistance of BIs. Tenants are somewhat satisfied that BIs are contributing to the creation of new ventures and employment opportunities in a moderately effective manner and view the facilities and services provided by BIs as critical to operating their businesses successfully. However, there exist a void between perceived significance and perceived effectiveness. The study finds that tenants are most satisfied with the marketing services and least satisfied with consultancy services provided by BIs in Pakistan, according to results. While this difference is slightly greater than average, it does not mean that BIs in Pakistan have failed to accomplish their mission. In Pakistan, business incubation is still in its infancy, and there is always room for improvement. This study highlights how Pakistan's BIs could be improved.

The purpose of a BI is not simply to provide infrastructure such as a building and a prime location, as almost every BI does; it is also necessary to pay attention to some other facilities such as meeting rooms, cafeterias, and internet facilities. Tenants were more dissatisfied with the lack of these facilities, as almost every business requires modern facilities such as internet connectivity to connect to the outside world in this globalized era, and they need access to modern tools and techniques. The majority of potential young entrepreneurs and students in Pakistan are unaware of this. This study will reorient graduates' thinking toward starting their own businesses, creating their own employment, and enlighten them as to how to best utilize the services of BIs in the infancy stage of the business.

References


Ethnic Diversity and Financial Performance of Deposit-Taking Savings and Credit Co-Operative Societies in Nairobi County, Kenya

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ABSTRACT

Purpose: The DT-SACCOs have proved to be important in the development and growth of both individuals and economies. However, the overall financial performance of DT-SACCOs in Kenya has not been impressive. Between 2014 and 2018, there was general decline in return on assets and return on equity of DT-SACCOs. The average return on assets was 2.51% in 2014 and 2.25% in 2018. The average return on equity was 33.09% in 2014 and 21.89% in 2018. The study examined the effect of ethnic diversity on financial performance of Deposit-Taking Savings and Credit Cooperative Societies in Nairobi County.

Design/Methodology/Approach: Agency theory, stakeholder theory and resource dependence theory guided this study. Explanatory and correlational research designs were used. Descriptive and inferential analysis was conducted.

Findings: Ethnic diversity was found to insignificantly predict return on assets ($\beta_2 = -.158; p > 0.05$) and return on equity ($\beta_2 = -.800; p > 0.05$).

Implications/Originality/Value: The study concluded that ethnic diversity of board members negatively and insignificantly affects financial performance.

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Introduction

The management team of Deposit-Taking Savings and Credit Co-operative Societies (DT-SACCOs) is made up of employees and need not necessarily be shareholders of the organization. The shareholders may not have the capacity to supervise the operations of the organizations directly. They elect the board of directors which is mandated to ensure shareholder welfare in making financial decisions (Olando, 2012). SACCOs tend to attract more customers than firms offering related services because of the kind of environment offered to clients. Equally, SACCOs have become very instrumental in empowering low-income earners as they promote small savings and loan systems (Bwana & Mwakujonga, 2013).
According to Olando (2012), SACCOs have become very instrumental in empowering communities on financial matters because of the financial performance strategies including low administrative costs and relatively wider pool of funds among deposit-taking SACCOs.

The modern concept of SACCO development can be dated back to 1844 with the Rockdale Society of Equitable Pioneers in Manchester, England. Over the years, several SACCOs have been developed around the world to fulfill the mission of economic empowerment in remote areas (Gatuguta, Kimotho & Kiptoo, 2014). Mathuva (2016) states that the cooperative movement has since spread across the world, with Africa being the last to join the queue from the immediate post-colonial times of the 1960s (Motompa, 2016). According to Motompa (2016), Father John Mcnulty formed the first SACCO in Africa in 1959 to help the rural farmers in Ghana to improve their economic conditions. The SACCO movement later became popular among the English-speaking African countries with Uganda, Nigeria, Tanzania, and Kenya joining the movement in the 1970s. As at 2010, the cooperative movement had been started in at least 28 countries in Africa (Motompa, 2016).

In Kenya, SACCOs movements have existed since 1908. The cooperative movement has spread so fast that as at the end of 2017, the number of registered SACCOs had grown to at least 5,000 cooperative societies (Motompa, 2016). The emergence of devolved system of governance further led to managerial devolution in the regional influence of the SACCOs. As at December 2018, SASRA reported 174 SACCOs registered as DT-SACCOs, evaluating their financial performance as a core competence aspect of economic development in the country. In Nairobi County alone, the regulating authority records have 42 DT-SACCOs registered to undertake deposit-taking transactions as at the end of financial year 2018. Such trend in numbers indicates how important SACCOs have become in the modern society (SASRA, 2019). Ideally, SACCOs should operate on the core ethical principles that consider the welfare of all. At the same time, the firms have to adhere to the core cooperative values of transparency, self-reliance and responsibility, equity, democracy, mutualism, etc. (SASRA, 2019).

The SACCOs have been recognized globally as a major contributing factor in vibrant economic growth as well as social empowerment because they avail finances to the poor people in the communities through savings and credit (Barus, 2018). Wanyama (2013) estimates that at least 70% of the African population including children belong to a cooperative society. To underscore the importance of DT-SACCOs in provision of financial services, SASRA (2019) gives a comparison on some performance parameters between DT-SACCOs, commercial banks, and microfinance banks between 2016 and 2018. While the networks of DT-SACCOs are increasing in terms of number of branches, the branch networks of commercial banks are showing a gradual decline. The lesser interest on loans and better interest offered on deposits as compared to commercial and microfinance banks are perhaps the reasons why DT-SACCOs have seen growth in their networks while the other institutions show a decline (Ochung, 2013).

In Nigeria, Ujunwa (2012) indicates that ethnic diversity in boards of directors could lead to better corporate governance which leads to more profitable business. In Nairobi County Kenya, board diversity positively and insignificantly relates with SACCO performance. Omwenga (2017) noted that board diversity has positive insignificant effect on financial performance of large tier SACCOs in Kenya.

The return on assets and return on equity are the main indicators of performance. SASRA uses loans, membership, assets, capital reserves, and deposits as the main parameters in monitoring performance increase of DT-SACCOs in the country. The report (SASRA, 2019) indicates a huge growth trend with combined total assets held by DT-SACCOs valued at Kshs 495.2 billion, 11.97% growth rate from the previous year. However, some DT-SACCOs have faced punitive measures such as de-registration or having limited licenses due to failure to reach the asset threshold (SASRA, 2019).
Statement of the Problem
The DT-SACCOs have proved to be important in the development and growth of both individuals and economies. Since the enactment of SASRA in 2010, the DT-SACCOs have realized a vibrant culture of small-scale savings and loaning among local people in the country. The overall financial performance of DT-SACCOs in Kenya has not been impressive despite the contribution that these financial institutions make to the economy. Between 2014 and 2018, there was general decline in return on assets and return on equity of DT-SACCOs. The average return on assets was 2.51% in 2014 and 2.25% in 2018. The average return on equity was 33.09% in 2014 and 21.89% in 2018 as shown in Figure 1.1 (SASRA, 2019).

![Average ROA and Average ROE](image)

**Figure 1: Trend for ROA and ROE for DT-SACCOs between 2014 and 2018**

*Source: Author’s compilation*

As at 2015, Kenya had a total of 181 registered DT-SACCOs out of which five DT-SACCOs as opposed to three recorded in 2014 had their licences revoked for failing to comply with the minimum licensing requirements (SASRA, 2015). In 2016, out of the 177 registered DT-SACCOs, 2 licences were revoked. By the year, 2018, only 166 had their licences intact. These trends in performance reports from SASRA de-registering and restricting licences of certain SACCOs indicate that there was need to understand what makes the differences in organizational management.

The global market is continuously embracing the idea of diversity in corporate leadership across all sectors. Mwendia (2018) noted that ethnic diversity positively and insignificantly correlates with return on assets, and the effect on ROA is also positive but insignificant. The study did not focus on return on equity as done by the current study. Moreover, earnings before interest and tax, and not earnings after interest and tax, was used in computation of return on assets. The researcher also collected secondary data from 2012 to 2016 as opposed to the current study that collected data from 2014 to 2018. Phan (2016) noted that academic qualifications attained by members of the board of directors has no significant correlation with ROA. However, the study was not done in Kenyan DT-SACCOs and did not focus on return on equity. The empirical studies reviewed show methodological gaps in terms of measurement of financial performance and also knowledge gaps in terms of the context within which studies were conducted. To bridge these gaps, the study determined the effect of board diversity on financial performance of DT-SACCOs in Nairobi City County.

**Objective**
To determine the effect of ethnic diversity of board members on financial performance of DT-SACCOs in Nairobi County, Kenya.

**Hypothesis Testing**
Ethnic diversity of board members does not have significant effect on financial performance of DT-SACCOs in Nairobi County, Kenya.

**Literature Review**
**Theoretical Review**
Relevant theories to the research are reviewed in this section. In the contexts of board roles in corporate
governance and financial performance, there are several theories to consider. For this task, the researcher focused on the following theories: Agency theory, stakeholder theory and resource dependence theory as discussed in the subsequent sections.

**Agency Theory**

Ross and Mitnick, in 1973, proposed this theory which seeks to understand some of the problems emerging when management acts on behalf of the owner. Agency theory principally argues that because of divergent views and interests of shareholders and the management, there is need for costs of agency such as contract specifications and managerial monitoring to ensure realization of corporate goals (Jensen & Meckling, 1976). Hence, trusting managers, the agent, is not optimal as per this theory (Mitnick, 2015). While Ross was responsible for the economic theory, Mitnick is associated with the institutional theory, although the two approaches to the theory are anchored on the same principles. The agency theory stems from concerns raised by Adam Smith in 1776 that professional managers handling money other than their own were being negligent. It assumes that there is always a cost attached to any kind of decision in the corporate governance of the firms. This idea is based on the concept that the owner and the manager are different hence conflicts of interest may arise (Mitnick, 2015).

Consequently, this theory tends to examine performance implications of corporate governance based on the cost associated to leadership and decision-making skills (Jensen & Meckling, 1976; Mitnick, 2015). Directors are elected to run the affairs of DT-SACCOs on behalf of members and therefore, they essentially play the role of an agent while the members are the principal. Some of the decisions made by the directors involve external players such as suppliers and lenders. A study by Kumburu, Pande & Buberwa (2012) in Moshi Municipality noted that 36.1% of variance in the SACCOs’ performance could be explained by the management (boards)’s decision to borrow funds from external lenders. This study clearly explains how choices made by the board can affect the performance of SACCOs, and if these choices are made based on biased considerations, the SACCOs can suffer severe losses. The theory is relevant to the objectives of determining the consequences of ethnic diversity of board on financial performance of DT-SACCOs.

**Resource Dependency Theory**

The theorists, Pfeffer and Salancik’s (1978) argue that understanding the organization requires comprehension of its ecology. This framework includes the arguments on the influence of environmental factors, which include both the external and internal aspects and how they affect the performance of the organization. One such concern is on the influence of power expressed by managers and how they can act to help to reduce uncertainties in the environment. Therefore, it is arguable that the financial performance of DT-SACCOs relies on the capacities of the board members as they express their power in the industry (Hillman, Withers & Collins, 2009). Scholars have followed Pfeffer arguments in studies related to board of directors. The theorists opine that the boards are vital in helping the firm to gain resources and/or reduce dependence. Nonetheless, the agency theorists explicitly explore how board of directors can influence organizational performances and sustainable development. Thus, the framework looks into board size and composition as the major diversity indicators. Consequently, the fundamental beliefs in this theory can help us to understand how ethnic diversity affects financial performance of SACCOs.

**Stakeholder Theory**

Ian Mitroff’s (1983) theory provides ground to study the link between performance, diversity of boards and inclusiveness that entails the aspects of these relationships that are qualitative (Jones, Wicks & Freeman, 2017). The theory focuses on the nature and features of groups that constitute the relevant stakeholders for an organization. Having a governance approach that takes into account stakeholders is important in partnerships between private and public sector and arrangement on delivering services collaboratively as it emphasizes a systems approach for representation of multi-stakeholder interests.
Conceptually, the theories of dependence on resource and the stakeholder theory are similar as regards the understanding, which is common on strategic leadership value. However, the point of difference is the argument that members of the board representing various stakeholders serve both the organizational and constituent groups’ interests. The point of interest is if organizations enhance their performance through collaboration involving stakeholders in governing the entity (Freeman et al., 2010). This theory aids to understand how ethnic diversity of board members affect financial performance of SACCOs of interest in the study.

Empirical Review
Mwendia (2018) noted that ethnic diversity members, positively and insignificantly correlates with ROA. It was noted that boards ethnic diversity, positively and insignificantly affects return on assets. The study did not focus on return on equity as done by the current study. Moreover, earnings before interest and tax, and not earnings after interest and tax, was used in computation of return on assets. The researcher also collected secondary data from 2012 to 2016 as opposed to the current study that collected data from 2014 to 2018.

Ogboi, Opemipo and Enilolobo (2018) studied corporate board diversity and performance of deposit money banks in Nigeria. It was revealed that the contribution of ethnic diversity has negative but statistically insignificant effect on ROA but its effect on market performance is positive and significant. However, the study was not in Kenyan DT-SACCOs hence contextual differences. In Kilifi County’s SACCOs, it was noted that boards were not adequately diverse and the composition of the board positively influences performance. However, the study was not done in Nairobi City County hence contextual differences in findings.

Conceptual Framework
A conceptual framework diagrammatically shows relationship between study variables. The independent variable was ethnic diversity. The dependent variable was financial performance of DT-SACCOs while the moderating variable was SASRA regulations as shown in Figure 2.

<table>
<thead>
<tr>
<th>Independent variables</th>
<th>Moderating variable</th>
<th>Dependent variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethnic diversity</td>
<td>SASRA Regulation</td>
<td>Financial performance</td>
</tr>
<tr>
<td>- Consideration in joining</td>
<td>- Capital adequacy ratio</td>
<td>- Return on assets</td>
</tr>
<tr>
<td>- Demographic heterogeneity</td>
<td></td>
<td>- Return on equity</td>
</tr>
</tbody>
</table>

Research Methodology

Research Philosophy
Research philosophy gives a brief description of how data is collected, analyzed and used besides the reasons for choice (Hughes & Sharrock, 2016). The researcher employed a positivist philosophy to determine and interpret the correlation between the financial performance and diversity in the society among the selected DT-SACCOs in Nairobi County. The philosophy aims at ensuring that there is a generalization of correlating factors because the actions are bound to real causes that are superior to just
behavior. Thus, positivism was adopted owing to the research problem at hand (Shah & Al-Bargi, 2013; Kivunja & Kuyini, 2017; Searle, 2015).

Research Design
The explanatory and correlational designs were considered appropriate. Explanatory research is conducted when there is need to establish the magnitude to which changes in one variable are reflected in changes in another variable. In this study, the correlation between board’s diversity and financial performance of DT-SACCOs was explained (Creswell, 2008). In correlational research, variables can either be linearly correlated, non-linearly correlated, or uncorrelated. On the other hand, the degree of a correlational relationship, if it exists, may be perfect, strong or weak. This research design has been adopted by scholars such as Mathuva (2016) and Kahuthu (2016).

Model Specification
The study hypotheses were tested using multiple regression analysis. The study adopted the following multiple regression models to examine the effect of the independent variables on the dependent variable.

\[ Y_1 = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \epsilon \] .. Equation 3.1

\[ Y_2 = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \epsilon \] .. Equation 3.2

Where:
- \( Y_1 \) is the dependent variable, return on assets
- \( Y_2 \) is the dependent variable, return on equity
- \( X_1, X_2, X_3 \) and \( X_4 \) represent level of education, ethnic diversity, gender diversity and professional skill mix of board members respectively
- \( \alpha \) is constant
- \( \beta_1, \beta_2, \beta_3, \beta_4 \) and \( \beta_5 \) represent regression coefficients for level of education, ethnic diversity, gender diversity and professional skill mix respectively
- \( \epsilon \) = error term.

Target Population
The study focused on board members of DT-SACCO. Geographically, the study covered Nairobi County and covered all the registered DT-SACCOs in the geographic region of interest. The target population was all 42 registered DT-SACCOs in Nairobi County (SASRA, 2018). The respondents were the CEOs who were the units of observation. The data collected included details of all the board members who have served in the DT-SACCO from 2014.

Sampling Technique and Sample Determination
Census survey was adopted to collect information from all the identified DT-SACCOs in Nairobi County. The target respondents were the Chief Executive Officers of the DT-SACCOs, representing the boards. Since the CEO’s office is the central office with all official documents, the CEOs were the only respondents that data was collected from (Mugenda & Mugenda, 2013).

Data Collection Instruments
Primary data on level of education, ethnic diversity, gender diversity, professional skill mix of board members and financial performance of DT-SACCOs was collected using semi-structured questionnaires. The questionnaire was appropriate because they allow respondents to answer questions willingly (Mugenda & Mugenda, 2013). The secondary data on financial performance for the last five years from 2014 to 2018 was collected from annual financial report records as well as electronic platforms like SASRA website (SASRA, 2019; Mugenda & Mugenda, 2013).

Pilot Study
7 SACCOs in Nairobi County were involved in pilot study, and were not involved in final study. Cooper and Schindler (2011) assert that at least 10% of study population should be involved in pilot study.
Validity Test
The researcher consulted the supervisors for expert opinion on the content validity of the research questionnaire before undertaking the final study (Mugenda & Mugenda, 2013).

Reliability Tests
The Cronbach’s alpha coefficient (CAC) test results are revealed in Table 3.1.

Table 1: Reliability of the Research Questionnaire

<table>
<thead>
<tr>
<th>Constructs</th>
<th>CAC</th>
<th>Test Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethnic diversity of board members</td>
<td>0.774</td>
<td>4</td>
</tr>
<tr>
<td>Financial performance</td>
<td>0.843</td>
<td>6</td>
</tr>
</tbody>
</table>

Source: Author’s compilation

The results indicated that ethnic diversity of board members had a CAC of 0.774 with 4 test items. Financial performance had a CAC of 0.843 with 6 test items. This implies that the research questionnaire was reliable as all the four variables had CAC greater than 0.7 (Heale & Twycross, 2015).

Data Analysis
Descriptive statistics was computed in terms of frequencies, percentages, means and standard deviations. Correlation and multiple regression analysis were also conducted. Data presentation was done using tables, graphs and charts.

Results and Findings
Descriptive Analysis
Descriptive analysis was based on ethnic diversity. The findings indicate that 45 directors from 20 (64.5%) SACCOs came from Central province. 33 directors from 15 (48.5%) SACCOs came from Nyanza province. 37 directors from 19 (61.3%) SACCOs came from Western province. 4 directors from 4 (12.9%) SACCOs came from Coast province. 31 directors from 20 (64.5%) SACCOs came from Rift Valley province. 64 directors from 12 (38.7%) SACCOs came from Nairobi province. 18 directors from 15 (48.4%) SACCOs came from Eastern province. 1 director from 1 (3.2%) SACCO came from North Eastern province.

The opinion of respondents on extent of adoption of ethnic diversity of board members was examined. The study determined that to a moderate extent, regional balance is a key consideration in board membership in the DT-SACCO (mean = 2.55; STD = 1.234). It was noted that ethnic diversity enhances greater creativity, innovativeness and quality decision making hence financial performance to a moderate extent (mean = 3.00; STD = 1.342). It was found out that to a moderate extent, ethnic diversity does not affect the financial performance of DT-SACCO (mean = 3.23; STD = 1.283). It was determined that the presence of the demographic heterogeneity at top management level tends to increase firm performance to a moderate extent (mean = 3.42; STD = 1.119). These findings tend to disagree with the findings in a study by of Ujunwa (2012) which noted that a diversity of board of directors on the basis of their regional diversity could eventually result to good financial performance.

Further results with regard to financial performance show that there was agreement to a great extent that the interest on deposits has been varying, either reducing or increasing, over the years (mean = 3.74; STD = 1.237). It was generally agreed to a great extent that the return on dividends was varying, either reducing or increasing, over the years (mean = 3.58; STD = 1.385). It was established that there was general agreement to a moderate extent that gender diversity in leadership affect the financial
performance of the DT-SACCOs (mean = 2.68; STD = 1.166). There was agreement to a moderate extent that the level of education of the board members has been a major factor in determining the financial performance results over year (mean = 3.42; STD = 1.148). There was agreement to a little extent that ethnic diversity in the board composition tends to affect the return on assets and investment of the firm (mean = 2.19; STD = 1.223). There was agreement to a great extent that the professional skill mix is very important in shaping the outcome of each financial venture in the DT-SACCO (mean = 4.39; STD = 0.715).

**Inferential Analysis**

Multiple regression analysis was conducted in order to examine the effect of ethnic diversity and financial performance of SACCOs in Nairobi County. The study conducted the t-test to ascertain the statistical significance of the regression coefficient of each independent variable. The results of test of the statistical significance of each independent variable are shown in Table 4.1.

| Ethnic diversity of board members | -0.158  | 0.309  | -0.097 | -0.510 | 0.615 |

**Table 2: Individual Regression Coefficients for Return on assets**

The results showed that ethnic diversity in board membership insignificantly predicted the return on assets of SACCOs in Nairobi County (β2 = -0.158; t = -0.510; p > 0.05). This contradicts results of Cho et al. (2017) who argue that workforce diversity is crucial and affects the performance of the organization positively. These findings tend to disagree with those of Ujunwa (2012) which noted that a geographically diverse board could eventually result to good financial performance. Ujunwa (2012) carried out research in quoted firms in Nigeria which include other firms apart from SACCOs and hence the research contexts are not the same.

The study also conducted the t-test to ascertain the statistical significance of the regression coefficient of each independent variable. The results of test of the statistical significance of each independent variable are presented in Table 4.2.

| Ethnic diversity of board members | -0.800  | 2.183  | -0.070 | -0.366 | 0.717 |

**Table 3: Individual Regression Coefficients for Return on Equity**

It was determined that ethnic diversity of board members insignificantly predicts return on equity of SACCOs in Nairobi County (β2 = -0.800; t = -0.366; p > 0.05; p > 0.05). The implication is that ethnic diversity of board members and return on equity of SACCOs in Nairobi County are negatively and significantly related. The findings contradict those of Cho et al. (2017) who argue that workforce diversity is crucial and affects the performance of the organization positively. These findings tend to disagree with those of Ujunwa (2012) which noted that a geographically diverse board could eventually result to good financial performance. Ujunwa (2012) carried out research in quoted firms in Nigeria.
which include other firms apart from SACCOs and hence the research contexts are not the same.

**Conclusions and Recommendations**

**Conclusions**

Ethnic diversity negatively affects return on assets of DT-SACCOs in Nairobi County. There is a moderate effect of regional balance on financial performance of DT-SACCOs.

**Recommendations**

The study recommendation for policy is in training programs for directors to acquire necessary capacity for board of management. For practice, the study recommends that directors and management of DT-SACCOs should be empowered to advise members on achieving ethnic balance. Future researches should focus more on non-regulatory factors such as internal controls in operations and best practices in financial management.

**References**


Impact of Behavioral Biases and Decision Analysis Methods on Investment Performance of Individual Investors at PSX

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ABSTRACT

Purpose: Market bubbles and crashes remain unexplainable by classical finance theories. Because the history of the Pakistan Stock Exchange has been marked by occasional market bubbles and crashes, a behavioral study is conducted to investigate the impact of investor’s behavioral biases on investment performance. Design/Methodology/Approach: Our research investigates behavioral biases and examines the role of such biases in the selection of investment decision methods. We then investigate the direct impact of behavioral biases on investors' investment performance, as well as how investment analysis methods play a role in mediating the impact of behavioral biases on investment performance. We identified 11 irrational behavior biases based on existing literature and in-depth interviews with brokers, and two decision analysis methods are used: fundamental and technical.

Findings: Our findings show that PSX investors exhibit moderately high levels of irrational behavior. Despite their moderately high level of irrationality, investors can use fundamental analysis to make better decisions and achieve better results. Since they use fundamental analysis method, they are boundedly rational rather than completely irrational.

Implications/Originality/Value: The fundamental analysis does not fully mediate three determinants of irrationality, namely anchoring, control, and overconfidence. Individual investors and brokers are concerned about reducing the impact of these three biases in order to achieve optimal performance. Brokerage firms and fund managers are recommended to consider the behavioral aspects of investors to predict the future because behavioral factors of investors can not only shape the investment trend of individuals but also the market at large.

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Introduction
The nature of equity investment is extremely volatile. It is difficult to comprehend and specify the determinants of returns on stocks traded on a stock exchange. At the backdrop of such a foggy environment and some historical debacles, increasing momentum of portfolio investment is a hard nut to crack. However, one thing could be inferred with conviction that there is some unusual attraction for investors in stock exchanges. History of stock exchanges is fraught with unprecedented gains and at some other times historical disasters. As a result, research to understand such odds by explaining underlying reasons of these upheavals for prudent investment decisions is the real need of the hour.

Lot of research has already been conducted on this phenomenon and various theories have been proposed to explain the behavior of investors since the start of last century. Principally we can divide these researchers in two categories viz. Classical theorists and Behaviorists. Classical theorists believe that humans are completely rational, and they always take optimal decisions. They proposed various theories like Markowitz Portfolio Theory by Markowitz (1952), Efficient Market Hypothesis (EMH) by Fama (1970), Capital Asset Pricing Model by Sharpe (1963) and Linter (1965), Option Pricing Theory by Black and Scholes (1973) and Arbitrage Pricing Model by Ross (1976). These theories are valid as long as market operates normally. However, when the market experiences a sudden, unprecedented rise or a historical disaster, these theories fail miserably.

There is a gap between widely accepted classical finance theory and actual settings, and behaviorists are studying investors' emotional and cognitive behavior to bridge this gap. The goal of behavioral finance is to explain why individual investors and markets deviate from the EMH (Nofsinger, 2017; Peter & Hede, 2012; Barber & Odean, 2011; Montier, 2010; Barberis & Thaler, 2003). Many researchers believe that behavioral finance helps explaining the impact of emotional and behavioral biases on investment decisions (Nofsinger, 2017; Hoffmann et al., 2015; Shanmugham & Ramya, 2012). Individual investor decisions and collective behavior define the market's overall behavior. Hence, behavioral finance is useful in explaining stock market bubbles and crashes. The majority of behavioral finance studies are conducted in developed economies, and they investigate a wide range of behavioral aspects (for example, biases such as confidence, overconfidence, optimism, pessimism, and herding) of individual investors and portfolio managers in relation to various market parameters (Strydom et al., 2019; Hoffmann & Post, 2017; Gervais & Odean, 2001). Cuthbertson et al. (2016) and Ahmad et al. (2017) also reviewed the literature from the perspective of institutional investors mainly from developed markets.

The overall performance of the Pakistani Stock Exchange (PSX) is regarded as one of the best performing emerging stock markets (Mangi, 2016), but there are a few disasters lurking beneath the surface of this impressive performance. These crashes wiped out billions of dollars in foreign portfolio investment, necessitating massive bailouts with public funds. The nature and scope of stock market activity are determined by investor behavior. Because a stock market is a significant source of equity capital for businesses, its performance is regarded as a barometer of a country's economic strength and development (Rasheed et al., 2018). Sherani (2014) points out that returns on PSX are in excess of returns on underlying corporate profits which is reflecting irrational exuberance at PSX. However rapidly soaring index is the real point of concern that is attracting crowds of novice investors. These investors are having fly by night attitude and throwing their money in quest of instant profits. This phenomenon creates irrational exuberance at PSX and spurs deviation of returns from actual fundamentals.

Muhammad and Abdullah (2009) suggested that impact of behavioral biases can be reduced by different
investor’s decision styles. Therefore, it is imperative to study the behavior of investors at PSX to explore the drivers of irrational behavior and role of investment decision methods used by investors on their investment performance. The main objectives of this study are to:

1. Investigate behavioral biases and their relative weightage in defining investor behavior
2. Investigate the relationship of behavioral biases and investment decision methods
3. Investigate the relationship between behavioral biases and investment performance
4. Investigate the role of investment decision methods as a mediator between relationship of behavioral biases and investment performance.

There are also several studies from Pakistan that look into various behavioral aspects of investor decision-making (Moueed & Hunjra, 2020; Rasheed et al., 2018; Shah et al., 2018). Our study, unlike theirs, not only analyze behavioral biases but also analyze the role of behavioral biases in the selection of investment decision method. Additionally, we analyze the direct impact of behavioral biases on investors’ investment performance but also probe that how investment analysis method comes into play in mediating the impact of behavioral biases on investment performance.

The organization of the paper suggests Section 2 reviews prior literature and formulates framework of the study. Section 3 discusses the methods employed to collect and analyze data, while Section 4 and 5 demonstrate analysis and discuss results. Finally, Section 6 delineates conclusion of the study and makes suggestions for future research.

**Literature Review and Hypotheses Development**

Classical finance label investors as rational human beings. According to Thaler (2008) such rational people are termed as "ECONS" to distinguish them from normal humans. A human cannot always behave like Econ. There are numerous emotions and biases that cause the rational mind to deviate from rationality. As a result, it is difficult to construct a model based on the assumption of perfect human rationality. According to Thaler (2010), investors are rational and price securities based on the efficient market hypothesis. According to Elton et al. (2004), inconsistent and irrational market movements can be used as a proxy to diagnose investors' irrational behavior.

However, irrational and inconsistent patterns can be found in all markets, whether they are underdeveloped, developing, or developed. The Grossman-Stiglitz paradox (1980), which states that if market prices reflect all relevant information, investors will have no incentive to acquire information, was a major setback to classical theories. Later, the global financial crisis of 2007-2010 numbed supporters of the efficient market hypothesis, and behavioral finance gained popularity as a way to explain such financial disasters. It is argued that biases in decision making are systematic in nature and predictable because they occur repeatedly and thus predictably in specific circumstances (Kahneman, 2011).

The human mind is hampered by the availability of limited information and its ability to process information only to a certain extent. Many psychologists believe that emotions such as love, hate, fear, pain, and pleasure govern human behavior rather than rationality (Zaidi & Tauni, 2012). According to Doskeland and Hvide (2011), asymmetric information is the primary driver of trading. If all investors have the same information, the same capacity to process the information, and are optimally rational, their price expectations will be the same, which may result in no trading activity at all. In his research on the Dhaka Stock Exchange, he discovered that neither absolute rationality nor absolute irrationality exists among stock market participants. As a result, we need a combination of rationality-based models and behavioral models to understand investors as they make financial market decisions.

Trifan (2020), Marquardt et al. (2019), and Angelini and Cavapozzi (2017) studied investors from
various countries and discovered that investors' judgement, emotions, and behavioral biases all have a significant impact on the stock market. Toma (2015) observed overconfidence, herding behavior, and other behavioral biases in investors in his study. Rocciolo et al. (2019) linked optimism to investor expectations about the market's risk, political, and financial events. Overconfidence bias explains financial market volatility (Ghufran et al., 2016; Jlassi et al., 2014).

Tuyon and Ahmad (2016) contend that adoptive rationality in the Malaysian Stock Exchange determines prices and stabilizes the market, resulting in adopted and bounded market efficiency. Filip et al. (2015) observed herding behavior among investors in the capital markets of Vienna and Prague. Vieira and Pereira (2015) investigated the behavior of investors in the Portuguese financial market. They discovered that herding intensity is negative and statistically significant, indicating that investors imitate one another in a systematic manner rather than using private information and acting irrationally.

Overconfidence has an impact on trading and investment growth (Bakar & Yi, 2016; Tuyon & Ahmad, 2016). According to Bakar and Yi (2016), there is a significant relationship between overconfidence and investor decision-making. According to Parveen and Siddiqui (2018) and Shah et al. (2018), overconfidence has a negative relationship with investment decisions. Furthermore, Javed et al. (2017) confirmed that overconfidence influences perceived investment performance positively. According to Bashir et al. (2019), there is no significant relationship between optimism and investor decision-making. Investment decisions are influenced by the investor's mood. A positive (negative) mood leads to positive (negative) decisions (Kaplanskiet al., 2015).

In the financial markets, the two main schools of thought regarding investment analysis methods are technical analysis and fundamental analysis. Technical analysis analyses a security's price trend and uses historical data to forecast future prices. Fundamental analysis, on the other hand, is based on a thorough examination of the firm's economic and financial fundamentals. People who invest for the short term and trade use technical analysis because they want to sell the underlying stock to someone else at a profit. People who intend to invest for the long term and want to analyze the real value of the stock rather than the nominal one, on the other hand, use fundamental analysis to make their decision. Trading on the basis of historical price movements can lead to stock market bubbles because this method completely disregards the underlying security's fundamental or real value. According to Peter and Hede (2012), the bubble phase causes share prices to reach unrealistic levels. These are share prices that are far in excess of what fundamental analyses can justify. Cheung and Chin (2001) discovered that short-term price changes do not correspond to changes in economic fundamentals. According to Marshall and Cahan (2008), short-term traders place a greater emphasis on technical analyses than on fundamental analyses. According to Jamal et al. (2013), investors are rational when they conduct fundamental analyses before making investment decisions. Muhammad and Abdullah (2009) determined the success of investment decisions based on the achievement of their goals. Investors are considered successful if they are able to meet their investment goals. They discovered that being a successful investor necessitates a mix of rational and irrational decision-making styles. Based on the literature review, we propose the following research framework in order to achieve our research objectives.
The following hypotheses are proposed:
H1. Investors’ behavioral biases have an impact on investment analysis methods.
H2. Investors’ behavioral biases have an impact on investment performance
H3. The decision analysis methods mediate the relationship between investors’ behavioral biases and investment performance.

Research Methodology
We identified 11 irrational behavior biases based on existing literature and in-depth interviews with brokers. Overconfidence, anchoring, control, conservatism, confirmation, status quo, mental accounting, optimism, familiarity, gambler’s fallacy, and herding are among the identified biases. In this study, two decision analysis methods are used: fundamental and technical. The questionnaire is divided into four sections: personal information, dimensions of investor’s behavioral biases, decision methods, and investment performance.

Population, Sample and Data Collection
The individuals who take financial decisions at PSX represent the population. Stratified random sampling is chosen as it is the best technique to get response in this case. We randomly selected a few brokers from PSX and through them accessed a random sample of 400 individual investors and distributed questionnaires to them to solicit responses of individual investors. We received back 367 questionnaires out of which 12 questionnaires were incomplete. Therefore, we excluded these questionnaires and took 355 questionnaires for further analysis.

Tools and Techniques
For multiple mediation, the collected data is processed and analyzed using AHP, SPSS, and Preacher and Hayes (2008) SPSS macro. The first step was to clean the data by removing any incomplete questionnaires. The maximum and minimum values were then observed in order to detect any errors in the data entry process. Following that, we verified the data's normality and the scale's dependability. The Kolmogorov-Smirnov Test is used to determine normality, and the Cronbach's Alpha Test is used to determine reliability. Following that, the AHP process was used to determine the relative importance of each bias in shaping investor irrationality. Finally, the bootstrapping method is used to test the impact of individual biases on investor performance via decision analysis methods mediation.

Data Analysis
Sample characteristics in terms of Gender, Experience, Age, Marital Status, Occupation and Education are described in Table 1, while Table 2 demonstrates correlation matrix of our main variables of interest.
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<th>Description</th>
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<th>Cumulative Percent</th>
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Source: Authors’ compilation

Table 2: Correlation Matrix

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<th>Anchoring</th>
<th>Control</th>
<th>Conservatism</th>
<th>Familiarity</th>
<th>M. accounting</th>
<th>Optimism</th>
<th>Confirmation</th>
<th>Status quo</th>
<th>G. fallacy</th>
<th>Herding</th>
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<td>.65**</td>
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<tr>
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<td>.47**</td>
<td>.37**</td>
<td>.48**</td>
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</tbody>
</table>
Kolmogorov Samirnov Test for Normality of Data
Kolmogorov Samirnov statistic is used to assess the normality of the distribution of scores. This test confirms that the data is normally distributed.

Cronbach’s Alpha Test for Reliability of Scale
It is a major concern of the study to check that all the items under a construct are really measuring underlying construct. In other words, we want to know the internal consistency of our scale. Cronbach’s Alpha test was used to assess the internal consistency and reliability of the scale. Cronbach’s Alpha statistic for the constructs of irrationality, decision analysis methods and performance are 0.890, 0.817 and 0.829 respectively. The statistic values for all the constructs of irrationality and decision analysis were more than 0.70. As statistic value for all the constructs is greater than 0.70 therefore our scale is reliable to measure what it purports to be measured.

Factor Analysis
The first step in factor analysis is to check the suitability of data for factor analysis. In order to determine suitability of data for factor analysis, there are two things to consider. First, the sample size should be at least 150 as mentioned in SPSS survival Manual by Pallant (2007). Secondly, correlation coefficients for most of the variables should be greater than 0.3. The first condition is fulfilled as sample size is 155 and second condition is also fulfilled as correlation coefficients are greater than 0.3. Pallant (2007) further says that KMO value should be greater than 0.60 and Bartlett’s Test of Sphericity should be significant at $p < 0.05$. The KMO value for our variables is more than 0.60 and Bartlett’s Test of Sphericity is significant at $p = 0.000$. Therefore, our data suits for factor analysis.

Eleven behavioral biases are coded to explore their impact on irrationality of investors. The analysis revealed that there are two components with eigenvalue exceeding 1 and explaining the variance of 43.815% & 22.527% respectively. After the process of elimination there are eleven behavioral biases left that explain 76.343% of variance in irrationality. Moreover, all of these biases have loading value more than 0.6. We also run the confirmatory factor analysis. All the eleven factors extracted from the exploratory factor analysis are confirmed with satisfactory goodness of fit test indices. The indices values are well satisfactory as $\text{RMSEA}=0.043$, $\text{NFIA}=0.947$, $\text{CFI}=0.963$, $\text{IFI} =0.965$ and $\text{NNFI}=0.961$.

The results of validity tests are given in table 3. The results of $\lambda$ coefficients for all the observed variables of all dimensions used in this study were significant ($t>1.96$) with standard loadings and $R^2$ coefficients greater than 0.50 confirming the convergent validity. Moreover, all the constructs exceed the level of 0.60 for composite reliability and 0.50 level of variance extracted which prove the internal consistency of the scale. The criterion of discriminant validity is also satisfactory as shown by all the constructs.

<table>
<thead>
<tr>
<th>Table 3: Reliability and Validity Statistics</th>
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<tbody>
<tr>
<td>CR &amp; Extracted Variance</td>
</tr>
<tr>
<td>1. Familiarity 0.798 0.746</td>
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<tr>
<td>2. Control 0.925 0.841</td>
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</table>
Determining Relative Weightage of Behavioral Biases using AHP Process

Analytical Hierarchy Process was developed by Satty (1977) and one of the best-known approaches to assess relative weights of multiple criteria. This approach is applied to know the importance wise ranking of behavioral biases in shaping rational or irrational decision-making style of investors. The study measures irrationality of individual investors with eleven different human biases. AHP process is used to define the relative importance of each bias in shaping irrationality of investors. Local weight of each item under every bias is calculated. Subsequently local weight for each individual bias is calculated. Product of both local weights gives us global weights which were multiplied by 100 to have a table that would show the importance of each bias in terms of percentage. The final result of this process is presented in Table 4 hereunder;

Table 4: AHP Global Weights for Biases

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Bias</th>
<th>G.W in % age</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Control</td>
<td>28.43</td>
</tr>
<tr>
<td>2</td>
<td>Gamblers Fallacy</td>
<td>21.8</td>
</tr>
<tr>
<td>3</td>
<td>Anchoring</td>
<td>17.6</td>
</tr>
<tr>
<td>4</td>
<td>Herding</td>
<td>8.98</td>
</tr>
<tr>
<td>5</td>
<td>Confirmation</td>
<td>7.82</td>
</tr>
<tr>
<td>6</td>
<td>Conservatism</td>
<td>5.99</td>
</tr>
<tr>
<td>7</td>
<td>Overconfidence</td>
<td>4.89</td>
</tr>
<tr>
<td>8</td>
<td>Status Quo</td>
<td>4.47</td>
</tr>
<tr>
<td>9</td>
<td>Familiarity</td>
<td>4.12</td>
</tr>
<tr>
<td>10</td>
<td>Mental Accounting</td>
<td>3.95</td>
</tr>
<tr>
<td>11</td>
<td>Optimism</td>
<td>3.75</td>
</tr>
</tbody>
</table>

The resulting table tells us that control, Gambler’s Fallacy and Anchoring Bias are critical factors having weights of 28.43%, 21.80% and 17.60% respectively. However, we can’t rule out importance of any variable because no variable is carrying less than 3.75% of weights which is, by no means an ignorable value. The study probes little deeper to identify the particular items (questions) in each bias that have highest impact on rational decision making. The items are arranged in decreasing order in terms of their importance towards irrationality.

Table 5: AHP Global Weights for Individual Items Related to Behavioral Biases
There are three items that have double digit impact in determining irrationality of investors at PSX, given below:

1. Investors consider that they can estimate their expected returns successfully.
2. They prefer to purchase the stock in down market.
3. They don’t prefer to sell the stock below purchase price.

Above mentioned three items belongs to control, Gambler’s Fallacy and Anchoring having weights of 14.76%, 14.53% and 11.73% respectively. These three items are responsible for 41.02% deviation from rationality among investors at PSX. Investors must realize that estimation of stock exchange returns is a Sphinx riddle. The random guess can work sometimes but there is no certain key to this riddle. They should keep into account all the relevant information and facts at the time of investment decision.

Investors at PSX prefer to purchase stock in down market. This is due to a psychological bias that makes them infer that market is bound to bounce back after dip. However, rise and dip in the prices depends on other fundamentals instead of past behavior of prices. Similarly, they have tendency to hold the stock if prices fall below purchase price. This tendency can lead them to sizeable losses at the time of crashes. So, investors should be able to overcome these biases in order to take savvy investment decisions and minimize suboptimal returns.

Impact of Behavioral Biases on Investment Performance (Mediation Analysis)
Preacher and Hayes (2008) SPSS macro for multiple mediation is used to analyze the impact of irrationality on performance through mediation of fundamental and technical analyses given in theoretical framework figure 1. Fundamental and technical decision analysis methods are taken as
mediators. Bootstrapping with 95% confidence interval and 2000 bootstrap resample provides results as shown in the table 6.

<table>
<thead>
<tr>
<th>Description</th>
<th>Indirect effect of Irrationality on Performance through Mediators (ab path)</th>
<th>Bias corrected and accelerated confidence Intervals</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Data</td>
<td>Boot</td>
</tr>
<tr>
<td>Total</td>
<td>0.1818</td>
<td>0.1822</td>
</tr>
<tr>
<td>Fundamental</td>
<td>0.1434</td>
<td>0.1467</td>
</tr>
<tr>
<td>Technical</td>
<td>0.0385</td>
<td>0.0355</td>
</tr>
</tbody>
</table>

Source: Authors’ compilation

The table 6 shows that confidence interval for technical analysis as mediator has lower limit of -0.0362 and upper limit of 0.1417. Since confidence interval includes zero, we can accept the null hypothesis i.e., ab=0. In other words, we can conclude that technical decision analysis is not mediating the impact of irrationality on performance. On the other hand, lower limit of confidence interval for fundamental decision analysis is 0.0337 and upper limit is 0.3226. This confidence interval doesn’t include zero therefore we reject the null hypothesis (ab=0). As such fundamental decision analysis method is significantly mediating the impact of irrationality on performance of investors. It can be reason out that fundamental decision analysis is reducing the power of irrationality and mediating its impact on performance.

Impact of individual biases on performance is also studied through bootstrapping to identify the major biases that have maximum impact on performance.

<table>
<thead>
<tr>
<th>DV</th>
<th>IV</th>
<th>Mediator</th>
<th>Path &quot;a&quot; Coeff</th>
<th>p</th>
<th>Path &quot;b&quot; Coeff</th>
<th>p</th>
<th>Path &quot;c&quot; Coeff</th>
<th>p</th>
<th>Path &quot;c'&quot; Coeff</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performance</td>
<td>Overconfidence</td>
<td>Fundamental</td>
<td>0.21</td>
<td>0.00</td>
<td>0.28</td>
<td>0.00</td>
<td>0.32</td>
<td>0.00</td>
<td>0.26</td>
<td>0.00</td>
</tr>
<tr>
<td>Performance</td>
<td>Anchoring</td>
<td>Fundamental</td>
<td>0.23</td>
<td>0.00</td>
<td>0.35</td>
<td>0.00</td>
<td>0.23</td>
<td>0.00</td>
<td>0.14</td>
<td>0.02</td>
</tr>
<tr>
<td>Performance</td>
<td>Control</td>
<td>Fundamental</td>
<td>0.24</td>
<td>0.00</td>
<td>0.28</td>
<td>0.01</td>
<td>0.35</td>
<td>0.00</td>
<td>0.27</td>
<td>0.00</td>
</tr>
<tr>
<td>Performance</td>
<td>Conservatism</td>
<td>Fundamental</td>
<td>0.17</td>
<td>0.01</td>
<td>0.37</td>
<td>0.00</td>
<td>0.31</td>
<td>0.00</td>
<td>0.25</td>
<td>0.00</td>
</tr>
<tr>
<td>Performance</td>
<td>Familiarity</td>
<td>Fundamental</td>
<td>0.29</td>
<td>0.00</td>
<td>0.36</td>
<td>0.00</td>
<td>0.31</td>
<td>0.00</td>
<td>0.21</td>
<td>0.01</td>
</tr>
<tr>
<td>Performance</td>
<td>Mental</td>
<td>Fundamental</td>
<td>0.18</td>
<td>0.02</td>
<td>0.40</td>
<td>0.00</td>
<td>0.23</td>
<td>0.01</td>
<td>0.15</td>
<td>0.03</td>
</tr>
<tr>
<td>Performance</td>
<td>Accounting</td>
<td>Fundamental</td>
<td>0.29</td>
<td>0.00</td>
<td>0.39</td>
<td>0.00</td>
<td>0.25</td>
<td>0.00</td>
<td>0.14</td>
<td>0.08</td>
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<tr>
<td>Performance</td>
<td>Optimism</td>
<td>Fundamental</td>
<td>0.44</td>
<td>0.00</td>
<td>0.36</td>
<td>0.00</td>
<td>0.29</td>
<td>0.00</td>
<td>0.14</td>
<td>0.09</td>
</tr>
<tr>
<td>Performance</td>
<td>Confirmation</td>
<td>Fundamental</td>
<td>0.37</td>
<td>0.00</td>
<td>0.49</td>
<td>0.00</td>
<td>0.15</td>
<td>0.03</td>
<td>-0.04</td>
<td>0.32</td>
</tr>
<tr>
<td>Performance</td>
<td>Status Quo</td>
<td>Fundamental</td>
<td>0.31</td>
<td>0.00</td>
<td>0.39</td>
<td>0.00</td>
<td>0.21</td>
<td>0.01</td>
<td>0.09</td>
<td>0.28</td>
</tr>
<tr>
<td>Performance</td>
<td>Gambler's Fallacy</td>
<td>Fundamental</td>
<td>0.47</td>
<td>0.00</td>
<td>0.51</td>
<td>0.00</td>
<td>0.16</td>
<td>0.03</td>
<td>-0.13</td>
<td>0.21</td>
</tr>
</tbody>
</table>

Source: Authors’ compilation

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Independent Variable</th>
<th>Mediator</th>
<th>Indirect Effects of IV on DV through Proposed Mediators (ab paths)</th>
<th>Bias Corrected Confidence Intervals</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Data</td>
</tr>
</tbody>
</table>

Table 8: Bootstrapping Result for Path “ab”

1012
Bootstrapping confidence intervals for every individual bias is showing that every bias is being mediated by fundamental decision analysis method because their confidence intervals don’t include zero. Boot coefficients are showing that herding, status quo, gambler’s fallacy, confirmation, familiarity, and optimism are more strongly mediated by fundamental decision analysis having coefficient (ab) values more than 0.10 as compared to other biases.

Fundamental decision analysis method is associated with rational decision making because investor tries to ascertain fundamental value of underlying investment by considering relevant information. As such strength of biases is reduced by fundamental decision analysis method when it acts as mediator. Nevertheless, the biases with lesser boot coefficient are the major drivers of irrationality. These biases include overconfidence, anchoring, control, conservatism, and mental accounting.

In table 7, Path “c” is not significant for optimism, confirmation, status quo, Gambler’s fallacy and herding. This result reveals that fundamental decision analysis is fully mediating these five biases. The result is also supported by the coefficients of bootstrapping that yield higher values for these biases.

Because the above mentioned five biases are mediated by fundamental decision analyses, their negative impact on performance is controlled by the investor's decision analysis technique. The remainder of the biases, on the other hand, are partially mediated by fundamental decision analysis, but their direct impact on performance is also significant. Overconfidence, anchoring, control, conservatism, familiarity, and mental accounting are examples of these. As a result, investors should be concerned about these biases. They can perform satisfactorily despite significant exposure to these biases as long as the market behaves irrationally. However, when the market begins to rationalize, the presence of these biases can seriously harm the performance of individual investors.

**Discussion of Results**

**Impact of Behavioral Biases**

Following factor analysis, we are left with eleven biases influencing investor decision-making at PSX. The gambler’s fallacy, anchoring, and control biases all contribute significantly to irrationality, according to AHP analysis. None of the other biases, on the other hand, are minor enough to be overlooked. According to bootstrapping analysis, anchoring, control, overconfidence, conservatism, and mental accounting all have significant but lower boot coefficients. As a result, these biases contribute more to irrationality, whereas the rest are mediated and controlled by a fundamental decision analysis method with a higher boot coefficient.

Hence anchoring and control are identified as major contributors towards irrationality. By the same token gambler’s fallacy and overconfidence are highlighted as major biases by at least two methods.
Since gambler’s fallacy is fully mediated by fundamental decision analysis method therefore three biases i.e., anchoring, control and overconfidence should be the real concern of investors at PSX. By reducing these three biases they can improve their decision making and reduce irrationality. Since these biases are positively correlated with other biases therefore decrease in these biases would lead to decrease in other biases as well.

Elton et al. (2004) suggest that irrational market moves are the proxy of irrational behavior of investors. Market returns at PSX are not matching with underlying corporate returns and thus reflecting irrational exuberance (Sherani, 2014) therefore individual investors at PSX can be considered irrational in general. Their decision making is affected by various biases. Empirical findings of the study show that all the biases are significant in shaping irrationality of investors. Therefore, it is worthwhile to discuss each bias in the context of investors at PSX.

Sample mean of each bias is computed to know its impact on irrational decision making of individual investors, on the basis of following criteria:

1. Mean value of less than 2 shows that the variables have very low impact.
2. Mean value of 2 to 4 shows that the variables have moderately low impact.
3. Mean value of 4 to 6 shows that variable have moderately high impacts.
4. Mean value of more than 6 shows that variables have very high impact.

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Bias</th>
<th>Mean Value</th>
<th>Impact Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Familiarity</td>
<td>5.24</td>
<td>Moderately High</td>
</tr>
<tr>
<td>2</td>
<td>Gambler’s Fallacy</td>
<td>5.21</td>
<td>Moderately High</td>
</tr>
<tr>
<td>3</td>
<td>Anchoring</td>
<td>5.12</td>
<td>Moderately High</td>
</tr>
<tr>
<td>4</td>
<td>Conservatism</td>
<td>5.02</td>
<td>Moderately High</td>
</tr>
<tr>
<td>5</td>
<td>Mental Accounting</td>
<td>4.97</td>
<td>Moderately High</td>
</tr>
<tr>
<td>6</td>
<td>Confirmation</td>
<td>4.96</td>
<td>Moderately High</td>
</tr>
<tr>
<td>7</td>
<td>Herding</td>
<td>4.84</td>
<td>Moderately High</td>
</tr>
<tr>
<td>8</td>
<td>Status Quo</td>
<td>4.79</td>
<td>Moderately High</td>
</tr>
<tr>
<td>9</td>
<td>Control</td>
<td>4.61</td>
<td>Moderately High</td>
</tr>
<tr>
<td>10</td>
<td>Optimism</td>
<td>4.58</td>
<td>Moderately High</td>
</tr>
<tr>
<td>11</td>
<td>Overconfidence</td>
<td>4.46</td>
<td>Moderately High</td>
</tr>
<tr>
<td></td>
<td>Overall Irrational</td>
<td>4.89</td>
<td>Moderately High</td>
</tr>
</tbody>
</table>

Source: Authors’ compilation

First objective of the study is to analyze the impact of behavioral biases in determining irrationality of investors. All the biases in our study have a moderately high level of irrationality. However empirical findings and earlier discussion divulge that anchoring, control, and overconfidence have higher impact as compared to other biases.

Mean value of irrationality is 4.89 which show that individual investors at PSX possess moderately high irrational behavior as given in table 9. A very interesting and strange result of the study is that irrational behavior of investors is positively related to their performance. This result is in contradiction with the literature which reveals that irrational behavior leads towards suboptimal decision and consequently below par performance. As such study gives a strange answer to first part of our second research question “What is the impact of irrationality of individual investors on their performance?”

The unusual answer of second research question calls for some further explanation that gives two underlying reasons. First, population statistics of investors tells that 69.3% of investors have less than three years of experience and 18.7% of investors have experience between 3 to 7 years. As such 88% of
individual investors have less than 7 years of experience. A careful review of PSX performance graph for last ten years would provide the rationale of strange results of first part of our second research question. PSX has steady and positive performance graph for last seven years. It didn’t meet any debacle and providing good returns to individual investors despite their irrationalities and suboptimal decisions. As a result, their performance is good in spite of their irrational behavior and suboptimal decisions.

Second, fundamental decision analysis method mediates the impact of irrationality on performance and controls the negative impact of biases. When irrational investors having moderately high degree of biases and use fundamental decision analysis, the strength of their irrational approach is reduced by fundamental decision analysis method. As such mediator steer the investor towards rationality and decreases the chance of suboptimal decision.

Fundamental decision analysis method allows investors to consider all available information according to their capacity to process that information. Jamal et al. (2013) told that investors are rational when they make fundamental analysis before taking investment decisions. However, the study reveals that investors at PSX have moderately high level of irrational behavior despite using fundamental analysis method. This can be explained through the notion of “bounded rationality (Simon, 1955)”, which says that human mind is handicapped due to availability of limited information and capacity to process information up to a certain level. Due to these limitations rational investors can also take suboptimal decisions. However, these decisions can’t be categorized as fully irrational. As such investors at PSX are bounded rational because they use fundamental decision analysis to take investment decision. This result supports Tseng’s (2006) finding that market participants are generally bounded rational and provides us with the answer of our second research question.

**Conclusion**

There are eleven major behavioral biases viz. overconfidence, anchoring, control, conservatism, confirmation, status quo, mental accounting, optimism, familiarity, gambler’s fallacy and herding that influence and shape the irrational decision making of individual investors at PSX. All of the biases have significant effect on irrationality. Investors at PSX possess moderately high degree of biases but presence of biases doesn’t decrease their performance due to mediation effect of fundamental decision analysis. Moreover, overall behavior of PSX is also irrational as mentioned by Sherani (2014). That’s why the investors with moderately high degree of irrational behavior are able to manage good performance at PSX.

People at PSX generally go for fundamental decision analysis which is positively related with their performance. Investors have fairly high dependence on fundamental analysis for their decision making. This technique allows them to control their irrational behavior and achieve satisfactory performance. The use of this technique appears linchpin in shaping good performance of investors at PSX. The study is an effort to highlight the reasons of irrational exuberance at PSX. This would assist the market participants to understand the reasons of irrational bubbles. Individual investors would be directly benefited from this study. They would be having better understanding of the underlying behavioral elements that lead them to suboptimal decisions. They can improve their performance by mending their behavior. Moreover, the study would be useful for brokerage firms to know and predict the behavior of individual investors at large.

The study recommends that individual investors can further increase their performance by reducing their key behavioral biases which are not completely mediated by fundamental decision analysis method. It further recommends that absolute rationality is nonexistent therefore investors should take decisions with bounded rationality. The study further recommends that fundamental decision analyses technique has positive impact on their performance therefore they should consider fundamental analysis of the
organizations at the time of investment instead of historical price trends. Brokerage firms and fund managers are recommended to consider the behavioral aspects of investors to predict the future because behavioral factors of investors can not only shape the investment trend of individuals but also the market at large. Further we urge researchers to explore the behavior of institutional investors at PSX. A detailed study could be carried out to know the behavior of individual investors in conjunction with institutional investors at PSX.

References


