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Relationship between Crime and Economic Conditions in Punjab A Time Series Approach from 1984-2015

Ayesha Naseem*, Irfan Hussain Khan ** & Sadia Naseem***

Abstract: Using the time series data from 1984 to 2015, this study attempts to explore Punjab economic situation and the relationship between criminal activities. Six variables are used for economic conditions, such as crime as a dependent variable, male dropout ratio, female dropout ratio, unemployment, household size and urbanization. We check their relationship with the reported crime. Augmented Dicky Fuller test for unit root process indicates that all variables are stationary at the level and first difference. For long-term relationships, Johansen Cointegration technology has been applied. The results of the statistical process show that dropout ratio and unemployment and other variables are closely related to crime. VECM has been applied to check the short-run relationship between the variables. VECM results show variables adjustment towards equilibrium. Study gives evidence that economic conditions have significant impact on crimes and increasing dropout, unemployment which is Positive related with crime in Punjab. It is also shown that the crime is influenced by economic condition.

Keywords: Crime rate, dropout, unemployment.

1. Introduction

Crimes have always plagued everywhere in human society. The account of crime is as timeworn as old times of mankind. Cain, son of Adam and Eve committed first crime by murdered his brother. Crime has a complex nature as a subject, for example, regarding its reasons and cost, various academic disciplines such as criminology, sociology, geography, psychology and demography study it from their own perspective. A relatively new emerging field, however, is the economics of crime which tries to identify the socio-economic causes and consequences of criminal activities in a society. Crime define in a wrong way by the state or the

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parliament of the country or law of the land. Each country sets out series of acts (crime), which are prohibited, and punishes a criminal of these acts by a fine or imprisonment or both.

Tappan (1960) defined that "A crime is an instrumental act or omission in violation of criminal law. The importance of economic growth has no denial both in theoretical and empirical economic literature. Growth of the economy is a fundamental objective in any policy decision making. Economic growth of an economy for a sustained period of time is a condition for poverty alleviation process. It makes possible the generation of employment opportunities as argued in Okun's law. Generated employment increases the sources of higher incomes. It is the economic growth that has enabled the modern world to achieve the development objectives of sustenance, Self-esteem and servitude. Objective of poverty alleviation can be achieved by increasing growth of the economy. The establishment of the basis of sustained growth trajectory of the economy warrants a suitable environment for investment. Though a sufficient amount of investment in talent and effort for policy making plays a vital role in growth and development of the economy yet law and order situation and governance has its own importance. Bad law and order situation and crimes create conflict in the economy. Crime increases uncertainty in the society. Crime is an intolerable phenomenon in any civilized society. The history of crime dates back to the origin of human history on this globe .There is no universal and permanent definition of the crime. In different era different definitions were presented. Any act or an omission that is forbidden, for the protection of public, by public law and is liable to be punished in a legal arranged in its own name is a crime (Marshal and Clark, 1952). In other words, crime is an Instrumental act of violation of law that is committed without any justification and sanctioned as offence by the state. Gillado and Tan-Cruz (2004) discuss about murder, physical injury, rape, theft, homicide and robber these crimes have their socioeconomic significance in the economy.. Crime is associated with money and acceptance the law breaking behavior. Crime discourages economic activities and hence is the burden in the development of the country. Organized crime is more damaging. Crime creates problems in daily life and it challenges the capability of the government. Crime affects negatively the accumulation of physical,

human and social capital. It increases production costs as because of crime expenditure on insurance premiums and private security increased. Crime also destroys the social infrastructure of the society. Fear generated by criminals affect productivity when employees are willing to work few hours or even not willing to work in a specific time periods or near in bad neighbors Higher criminal activities have created insecurity in the economy.

Various reasons support that education make less criminal activities; first schooling increases the return to sincere work and increase opportunity cost of illegal behavior Freeman, (1996). Furthermore, custody and big punishment needs for t for the criminal behavior. If higher wage is offered then opportunity cost of schooling becomes higher. Second, schooling may have direct effect on financial reward itself. Finally, schooling may affect the change preferences in indirect ways, which may affect decision to involve in crime. For example education leads to more one's patience (Becker and Milligan, 1997).

Other economic variable also affect crime and one of them is unemployment. Crime and labor market are interlinked. The incentive for the criminal activities increases with the unemployment, zero income and low income which makes the cost benefit analysis easy for the individual (Fleisher, 1966).

1.1 Unemployment and Economic growth

Unemployment is a multi-dimensional phenomenon; it is an economic phenomenon showing imbalance in economic activity. Moreover, it is also considered social phenomenon because of its effects on the social structure of societies. For the objectives of monetary policy or fiscal policy economic growth is main goal. The investment leads to achieving rate of sustained economic growth in the national economy and addressing the problem of unemployment. The greater the unemployment rate; the less opportunities to achieve high economic growth as well as the emergence of the negative social aspects. Unemployment is an worldwide marvel with the economic and social effects. All countries including developing ones confront this phenomenon; these states move slowly in economic growth whereas affected by population growth with a design and shape of the population pyramid, revealing a high rate of dependency

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and causing the high economic and social cost of unemployment and its relationship to economic growth. When community does not use work force fully is called unemployment condition (Habees 2012).

1.2 School dropout and crime

We define dropout as, any student who leaves school for any reason before graduation or completion of a program of studies without transferring to another elementary or secondary school. High school dropouts are having a harder time finding and keeping jobs than individuals with higher levels of education. Young high school dropouts are much less likely to be active labor force participants than their higher-educated peers. Dropping out of high school is positively associated with crime (Thornberry 1984). Education has two possible ways to reduce crimes. First way is that good education increases the opportunity cost of crimes because criminal needs time for committing crime and that time cannot be used in other productive purposes like legal work because high education confirms the better job opportunities in legal sector. Second is the time wastage of criminal for being in custody or in jail. This cost is very high for criminal because he can raise his income by spending his time in other ways (Lochner 2007).

1.3 Household size and crime

Large Household or more children increase the consumption level and these phenomena create high poverty level (Libois 2018). If family members are more and income level less than people do criminal activity for fulfill their consumption needs. High household size positively related to crime. As household size increase and income level low, then it lead to increase the criminal activity.

1.4 Urbanization and crime

Urbanization also effect crime rate. People don't have jobs opportunities in rural areas so people move to cities. Unplanned urbanization may contribute to crime, and since urbanization in Pakistan is unplanned (Arif 2003).

1.5 Research questions

After excess of studies, multiple questions arise in mind. Is dropout of children contributing to crime? Is child labor responsible for the dropout of children from school? How large household contributes in crime? How crime and economic growth links? How unemployment effect crime?

1.6 Objectives

To determine the association between reported crime and economic conditions.

To find out the connection between dropout ratio and reported crime.

To trace the relationship of unemployment and reported crime.

1.7 Research methodology

This present study uses time series data, therefore estimation techniques need to be consistent with the standard properties of time series data. Unit root exist in time series data. If time series data contains unit root, then Ordinary Least Square (OLS) cannot be used to report consistent and efficient estimates. Therefore, for check the presence of Augmented Dickey Fuller (ADF) unit root used in study. However, in case of evidence of unit roots in the data, Johansen Co-integration technique can be used to find the association between variables. For check the long run and short run results and impact on independent variables on dependent Vector error correction model and granger causality use. These two modifications contribute to the validity of the estimates.

The maximum possible number of years of time series data has been collected, that is, from 1984 to 2015 which make it of 32 years data. In this context, the study is restricted to the total of six variables for ensuring sufficient degree of freedom for econometric modeling. Out of these six variables, dropout male and female, unemployment, Urbanization and household size are independent variables whereas; crime is the dependent variable. Econometric properties of the estimates are checked using various tests.

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1.8 Research gap

Researcher carried studies by concentrating on crime reduction. This research focused on crime study on Pakistan level but there is no study on Province level to understanding crime effects on state so this become a research gap. Education is necessary to reduce crime because more education less unemployment and less crime. More educated will less likely to go for crime (Moretti 2009).The above study is well organized but still there are many loop holes that need to be filled with rigorous research work, with the proper organizing of institutes. If institutes and staff are not well established then there will be more dropouts and unemployment.

2 Literature review

Goulas (2012) explored that how the crime-uncertainty interaction impacts on economic growth. Using a panel of 25 countries over the period 1991-2007, he find evidence that increased crime has an asymmetric effect on growth depending on the future prospects of the economy as reflected in the degree of macroeconomic uncertainty. the results indicate that higher-than-average macroeconomic uncertainty enhances the adverse impact of crime on growth implying that a 10% increase in the crime rate can reduce annual per-capita GDP-growth by between 0.49 and 0.62 percent.

Habees and Rumman (2012) argued that relationship between unemployment and economic growth in Jordan and some Arabcountries. Unemployment is considered as an economic indicator in this study. The high rates of economic growth and the decline in the unemployment rate do not confirm the existence of strong relationship between growth and unemployment. Despite the rate of growth is positive, it is not possible at present to reduce unemployment rates significantly in some Arab countries such as Algeria due to restructuring the Algerian economy which relies heavily on growth in the hydrocarbon sector, which despite its importance does not create jobs in large numbers.

Kumar (2013) explained state level data to analyze causal links between crime and growth. It is found, applying instrumental variable methodology, that higher levels of crime rate hamper per capita income and economic growth rates. International homicide and robbery rates negatively affect growth rates. Lowering of the homicide rate at national minimum level increases average annual growth rates. Moreover, it is observed that loss in growth is smaller in the states with higher per capita income. The results in Kumar (2013) are evident that quality of political, legal, economic institutions and socioeconomic policy environment may be helpful to crime levels and economic growth.

Raja *et al.* (2013) described time series data explored the relationship between economic conditions and criminal activities in Pakistan. Dicky Fuller test suggested that all variables are stationary at the first level. For the long run relationship Johanson cointegration technique applied. Coefficient of Gini index is high which means that in long run income inequality affects the crime ratio. Inflation reduces the purchasing power which becomes a cause of crime.

Ahmad *et al.* (2014) study examined the impact of crime on the economic growth of Pakistan by using yearly data from 1980 to 2011. Autoregressive Distributive lag (ARDL) to cointegration is used to find short and long run relationship between crime and Economic growth. In short run crime has negative, but insignificant effect on economic growth. Results of long run reveal that crime has negative and significant effect on economic growth. This negative relationship between crime and economic growth highlight that criminal activities slow down development projects as well as growth of Pakistan economy

Latif *et al.* (2015) discovered the causes of student's dropouts. In different areas there are different reasons for student dropout. Students never dropout from school for a single reason. The main reason is weak financial and economic problems. Education is a basic key for refining life standard, employment opportunities and high efficiency level. If dropout ratio increases fast it may decrease productivity level and unemployment ratio.

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Guzman (2015) analysed the effects of crime on Mexican city. Periodical data from 1990 to 2010 used in this study. Vector Error Correction model used to find the results. The short run results exposed that none of the constituents of aggregate demand distress crime and that the only constituent of aggregate demand affected by crime is private consumption, which is affected negatively by an increase in the crime rate. Further results revealed that crime has a positive effect on GDP, government consumption and imports in the long run. On the other hand, private consumption, investment and exports have a negative effect on crime in the long run.

James (2016) describe that energy explosion has affected regional crime rates throughout the country. There are positive effects on rates of various property and violent crimes in shale –rich countries. Rise in crime rates was caused by demographic shifts or rising population that reduced law implementation.

Cortes *et al.* (2016) explored that the crash down of Ponzi Schemes in 2008 in Colombia as a natural experiment to estimate the causal effect of a financial-crisis ambitious economic shock on subnational criminal results. The Failure of the structures affected hundreds of thousands of investors who lost millions of dollars, making the episode under study one of the largest Ponzi crisis of recent history.

Sloan (2016) study tells about the impact of various powerful crimes on restaurant location decisions in a single city, Memphis, T.N. Each crime is positively connected to the number of new restaurants in a package. But, even with the crime problem, these locations provide sufficient benefits, Perhaps population density, which makes them too attractive to restaurant entrepreneurs occurrence of crimes.

Rios (2016) finds crime and violence impact growth via changes in economic factor increase, i.e. reducing labor supply or increasing capital costs. Homicides rates increase by more than 22.5%, and gang-related violence increases by 5.4%. An increase of 9.8% in the number of criminal organizations is enough to eliminate one economic sector. This study

show that increases in criminal attendance and violent crime reduce economic divarication, increased sector attentiveness, and diminished economic difficulty.

Sharkey (2016) used longitudinal data and an array of empirical methods this study assessed strong evidence that the level of powerful crime in a country has a causal effect on the level of increasing economic mobility amongst individuals raised in families. Exploratory evidence suggested that violent crime may increase the prevalence of high school dropout.

Ghani (2017) finds that Urbanization has created various social problems, among which is crime that became a collective portent to all urban areas in both developed and developing nations. Crime increase in many parts of the world along with the unemployment and poverty. Nature of crime is not uniform but varies from one physical region to another. Crime is not a single factor; there are unequal factors that encouragement criminal activities.

Libois *et al.* (2018) studied the link between a household's fertility choices and deviations in their size and structure. The results exposed that number number of children affects from household size in an unforeseen manner. Increasing the household size or having more children would straightpay to a household's poverty.

3 Materials and methods

This section is encompassed in such a way to investigate the data related substances to emerge the study objectives through calculation and approximation of the considered data along with examining and discussion the results. It does also include area of study, reasons of study, exploration new techniques, research variables, and recognitions method and model collection for desire results. Furthermore this study analysis technique to achieve research objectives and research questions.

3.1 Area of study

The study area that is focused in this study is Province Punjab. This study is about crime and economic conditions in Punjab which cover

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time period from 1984-2015. In Pakistan most of research on crime focused overall Pakistan but in province level there is no study. That is the reason for selection of this area to check how different variables effects crime in Punjab.

4 Theoretical framework

One of the oldest theories of criminal behavior is the rational choice theory, which was first developed in the late 18th century and, since then, has been expanded on in many different ways. As other theories about criminal behavior have developed, they have been linked to the idea of rational choice and have created a broader interpretation of what rational choice means.

According to Nobel Prize-winning economist Gary Becker(1968) rational choice theory is used in both criminal and non-criminal behaviour. It involves intentionally committing some act because the reward gained from that act will be greater than the risk associated with it.

This theory rules out such factors as biological, psychological or environmental factors that might force someone to commit a crime. Instead, it asserts that criminals make a choice to commit a crime after weighing the costs. They also will consider the benefit of not committing the crime, but ultimately determine that the rewards of the crime are greater than the benefit of not committing the crime. From review considering Gillani and Lochner work we build a model in which the following determinates of crime are taken.

Crime=f (unemployment rate, Male Dropout ratio, Female Dropout ratio, Household size, urbanization)

In the above model both pure economic and socioeconomic determinants of crimes are considered. First variable is used unemployment rate and it is observed that if the person is unemployed then he must adopt some other ways to get money. Moreover, for an unemployed person, the opportunity cost of committing a crime is also low, which may force him to be involved in illegal activities. Thus, unemployment may have positive effect on crimes . Next variables are used male and female drop out ratio. Many children cannot complete their high school even primary education. Then they involve in criminal activities. Education can reduce

the crimes through wages. Basically education is the source for raising wage of a person. Lochner (2007) argued that education has two possible ways to reduce crimes. First way is that good education increases the opportunity cost of crimes because criminal needs time for committing crime and that time cannot be used in other productive purposes like legal work because high education confirms the better job opportunities in legal sector. Second is the time wastage of criminal for being in custody or in jail. This cost is very high for criminal because he can raise his income by spending his time in other ways. Large Household or more children increase the consumption level and these phenomena create high poverty level (Libois 2018). Urbanization also effect crime rate. People don't have jobs opportunities in rural areas so people move to cities. Unplanned urbanization may contribute to crime, and since urbanization in Pakistan is unplanned (Arif 2003).

4.1 Data Sources

Variables data used from various surveys, reports and articles. Data of all reported crimes are taken from Punjab Development Statistics. Data on unemployment are taken from Pakistan Bureau of Statistics. Male dropout and female dropout data are collected from Pakistan Bureau of Statistics. Data for Household size are taken from Household integrated economic survey (HIES) and data for urbanization are taken from Labour force survey and Pakistan Bureau of Statistics.

5 Empirical framework

Error Correction model and Granger causality use for the final results. They data type use is secondary and data period is from 1984 to 2015. Here check the adjustment of variables short run towards long run and how they affect crime. All reported crime use as a dependent variable and unemployment rate, female dropout, male dropout, household size and urbanization use as independent variables.

For check the relationship among variables used Granger Causality and Vector Error Correction Model (VECM) model use. According to Gillani (2009) for check the nexus unemployment, poverty, inflation and crime used causality and cointegration. Guzman (2015) checks the crime effects

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on Mexican economy Vector Error Correction Model (VECM), Augmented Dickey Fuller use. Habib Ullah and Law(2010) work on Property crime and macroeconomic variables in Malaysia by using Vector Error Correction Model (VECM) and Augmented Dickey Fuller use and results shows positive effect.

5.1 Analytical Model

The dependent variable set in the study is crime ratio; all reported crime ratio are taken in whole work. Unemployment rate (U) is simply the number of unemployed person out of total labour force. Male and female drop out refers percentage of students failing to complete a particular school or any institution course.

$$C = \beta_1 + \beta_2 U + \beta_3 MDR + \beta_4 FDR + \beta_5 HHS + \beta_6 UR + \mu_i \quad (1)$$

C= All Reported Crimes

β_1 = Constant

U= Unemployment rate

MDR= Male Dropout Ratio

FDR= Female Dropout Ratio

HHS= Household Size

UR=Urbanization

μ_i =Error term

In the above model, crime is used as a dependent variable. Unemployment rate, Male and female dropout ratio, Household size and urbanization are used as an independent variable. β 's shows coefficient and μ_i error term. The co-integration test is performed in two steps: first, a single series is tested to achieve a common integration sequence. If the series is the same order, which would mean synergistic integration. Using the Augmented Dickey Fuller (ADF) test, stationary series for testing. The ADF test is a standard unit root test; it analyses the order in which the data sequences are integrated.

5.2 ADF Unit Root Test

Augmented Dickey Fuller (ADF) test used for check the stationarity when data is time series. In this thesis used the Augmented

Dickey Fuller test. Augmented Dickey Fuller is a test of Unit Root for time series data.

Following are the form of ADF test equations.

$$\Delta y = \alpha_0 + \gamma y_{t-1} + \sum_{i=1}^p \beta \Delta y_{t-i} - 1 + \mu_t$$

$$\Delta y = \alpha_0 + \gamma y_{t-1} + \alpha_2 t + \sum_{i=1}^p \beta \Delta y_{t-i} - 1 + \mu_t$$

μ is an error term and this error term is white noise.

Dickey and Fuller in 1977 provide augmented dickey fuller(adf) test and deliver accumulative distribution of augmented dickey fuller test statistics by showing if calculated value is less than critical value of adf then y is stationary.as error term is improbable to white noise dickey and fuller extend their test results and comprise the additional lag term of dependent variable in order to exclude autocorrelation.

This test is not committed for small data because of its power and size. Adf provide wrong direction when data set is so small, in sometimes it reject null-hypothesis when its true and accept when it is incorrect. power and size properties problem solve through two new tests ,dickey fuller generalized least square (dfgls) and ng-perron tests.

5.3 Johansen Cointegration Analysis

Johansen-co-integration shows the degree of association among variables.it shows the long term relationship between two or more than two variables.Co-integration used for any econometric model that is non-stationary time series. Co-integration occurs when calculated when calculated statistics values are significantly different to zero. If all variables stationary at 1st difference then Johansen co-integration apply.

5.4 Vector Error Correction Model (VECM)

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A vector error correction (VEC) model is a restricted VAR designed for use with non-stationary series that are known to be cointegrated. The cointegration term is known as the error correction term since the deviation from long-run equilibrium is corrected gradually through a series of partial short-run adjustments. The vector error correction (VEC) model is just a special case of the VAR for variables that are stationary in their differences $I(1)$. The VEC can also take into account any cointegration relationships among the variables.

VECM used when following conditions occur

- (1) the time series are not stationary in their levels but are in their differences
- (2) the variables are cointegrated.

An error correction model belongs to a category of multiple time series models most commonly used for data where the underlying variables have a long-run stochastic trend, also known as cointegration.

5.5 Results and Discussion

In this section comprise the data results. This section is significant judgment of investigator the struggle is based on secondary data. In the first step of thesis is descriptive statistics, in second step Augmented Dickey Fuller (ADF) test apply for stationarity, third step for Cointegration which tells association among variables then Vector Error Correction (VECM) and Granger Causality used for short run and long results.

Crime is dependent variable and Unemployment, Male dropout, Female dropout, Urbanization, Household size use as a independent variables to check how much crime affected by these variables.

Table 5.1: Descriptive Statistics

	Reported crime	Drop female	Drop male	HH size	Unemploy ment	Urban
Mean	3.30091	1.6281	0.8911	6.19468	0.32707063	16.048

	7	25	25	8		13
Median	3.30092	1.8000	0.7500	6.26500	0.242500	16.510
	1	00	00			00
Maximum	3.30427	2.1400	3.4300	7.58000	1.750000	18.740
	5	00	00	0		00
Minimum	3.29754	0.0900	0.0600	5.01000	0.023000	12.230
	2	00	00	0		00
Std.Dev.	0.00203	0.5305	0.6808	0.59053	0.395031	2.2368
	8	96	41	1		13
Skewness	.000552	.20646	2.1257	.013769	2.825447	.05603
	5	09	80	3		76
Kurtosis	1.79769	6.1507	8.0435	3.61161	10.22894	1.8512
	5	14	03	6		87
Jarque-Bera	1.92754	2.0540	1.0169	0.59972	2.509080	3.4036
	3	8	1	0		68
Probability	0.38145	0.0000	0.0000	0.74409	0.000000	0.1823
	2	00	00	22		49
Observations	32	32	32	32	32	32

Source: Author's calculation using Eviews software 9.

5.6. Interpretation of Descriptive Statistics

Finally, the behavior of unemployment rate is given in the table no 5.1. The average unemployment in during 1984 to 2015 is 8.58 which is a double digit rate. However, there are very high and very low unemployment rates in Pakistan as well. Probability value of all variables are greater than 0.05 which normal distribution of data. The highest Similarly, lowest unemployment which observed very low in Pakistan. The value of skewness suggests that distribution of crime is positively skewed; with leptokurtic distribution as value of kurtosis is greater than 3. It means that distribution of urbanization is sharper than normal distribution, which is also reflected in the significant value of Jargue Bera test.

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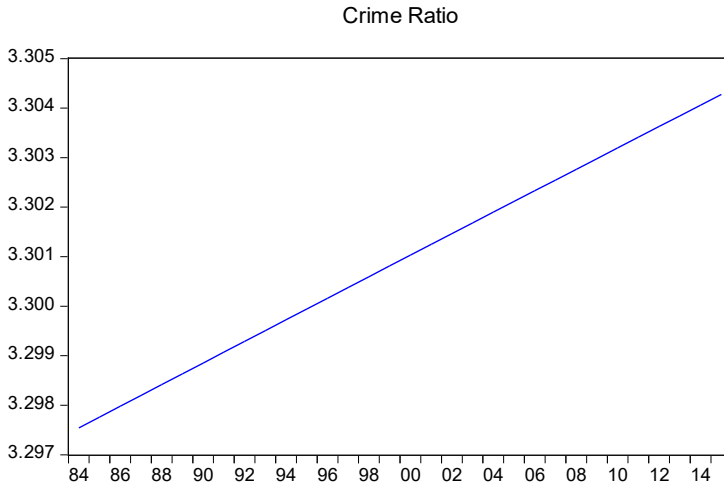


Figure 5.1 Crime Ratio

The figure shows that crime rate increase as with year increase. straight line shows direct relation in which at every level crime rates growing up.

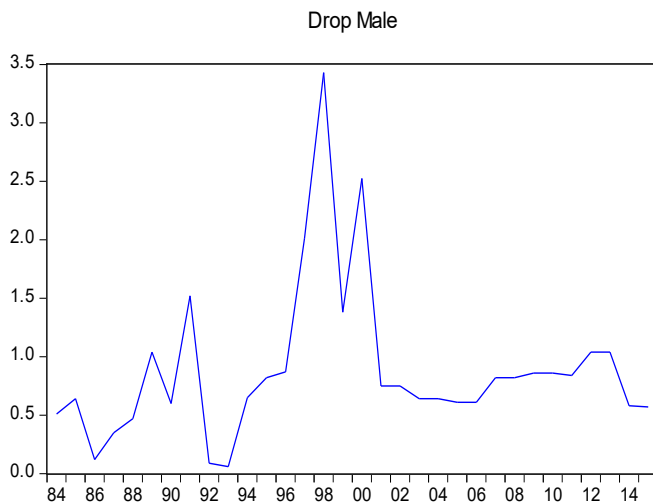


Figure 5.2 Dropout Male

The figure shows male dropout ratio. this diagram showing trend in dropout ratio. Male dropout reached 0.5 percent after that 3.0 and then decline. less male dropout ratio is a good sign.

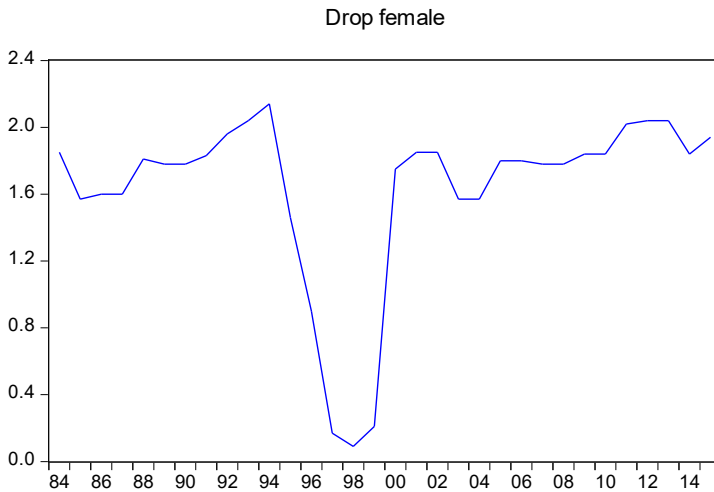


Figure 5.3 Dropout Female

The figure shows trend in dropout female which describes that dropout rate reached at 2.0 percent. Female dropout rate is high than male dropout. according to National womens Law Center ,A US research finds that girls are dropping out of high school greater than boys which have greater economic cost.

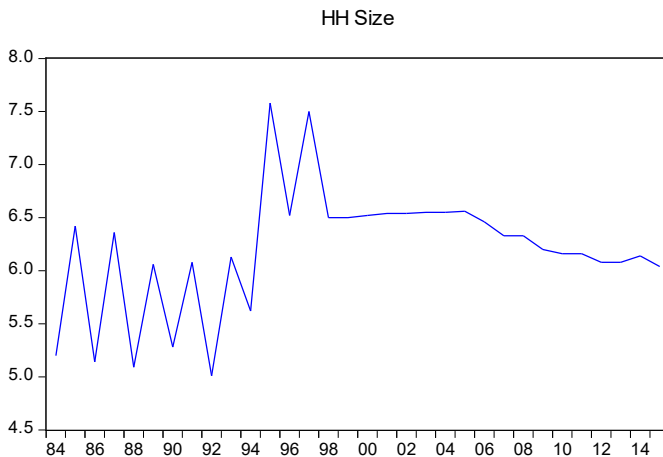


Figure 5.4 Household Size

This figure shows household size trend. As per years increase household size increase. but as we see after some time this size become low it may be due to some awareness because low household size bring low

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consumption and expenditures which is a good sign for prosperity in family.

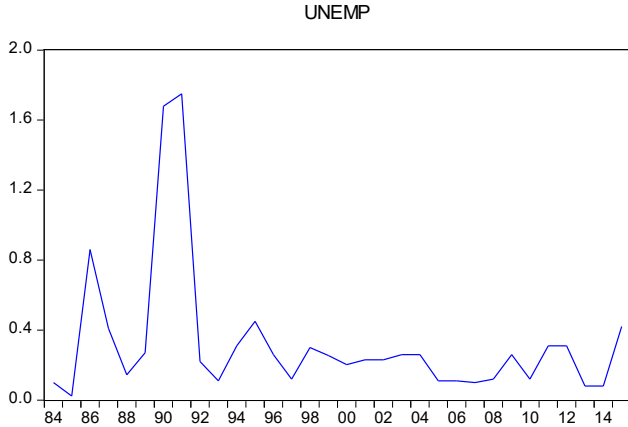


Figure 5.5 Unemployment

This diagram shows unemployment trend.as years increase unemployment level increase.High unemployment brings high crime rates which affects society and economy badly.

5.7 Estimation of Econometric Model

Table 5.2 Stationary Tests (Agumented Dickey Fuller (Adf))

VARIABLE	At level		AT FIRST DIFFERENCE	
	T statistic	- P-value	T -statistic	P-value
Reported crime	-2.788898	0.0096	-2.7865498	0.0218
Dropout female	-2.788898	0.0718	-4.522299	0.0013
Dropout male	-3.437961	0.0171	-8.687813	0.0000

HH size	-	0.1696	-3.066017	0.0406
	2.330904			
Unemployment	-	0.0136	-7.681213	0.0000
	3.533526			
Urban	-	0.0288	-1.812375	0.3668
	3.228491			

Source: Author's calculation using Eviews software 9.

5.8. Interpretation of Augmented Dickey Fuller test

The table 5.2 summarizes the results of the ADF tests at the level and first differences of all variables, including all possible options, i.e. constants. One of the purposes of Table 5.2 is to use more robust estimation techniques to confirm the results of symmetric analysis. The effectiveness of the ADF test depends on the appropriate hysteresis length selection and the appropriate options, none, constant and both.

This Augmented Dickey Fuller(ADF) test explains variables are stationary or non-stationary. If data is non-stationary or stationary at second difference its difficult to understand which test apply and also data is not reliable. The data is stationary if ADF value is greater is smaller than critical value and ADF statistical and critical values are always negative. In this model all variables are stationary at first difference except two variables Urbanization and Household size ,they both stationary at level.

Table 5.3 Johansen Cointegration Results

Trace and Maximum Eigen Value Test

Unrestricted Co-integration Rank Test (Trace Test)				
Hypothesized		Trace	0.05 percent	
No. of CE(s)	Eigen value	Statistic	Critical Value	Prob.**

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None *	0.999999	600.1552	95.75366	0.0001
At most 1 *	0.912496	183.0971	69.81889	0.0000
At most 2 *	0.803822	110.0150	47.85613	0.0000
At most 3 *	0.661201	61.15294	29.79707	0.0000
At most 4 *	0.462329	28.68253	15.49471	0.0003
At most 5 *	0.285073	10.06726	3.841466	0.0015

Unrestricted Co-integration Rank Test (Maximum Eigen value Test)

Hypothesized No. of CE(s)	Eigen value	Max-Eigen Statistic	0.05 percent Critical Value	Prob.**
None *	0.999999	417.0581	40.07757	0.0001
At most 1 *	0.912496	73.08208	33.87687	0.0000
At most 2 *	0.803822	48.86204	27.58434	0.0000
At most 3 *	0.661201	32.47042	21.13162	0.0009
At most 4 *	0.462329	18.61526	14.26460	0.0096
At most 5 *	0.285073	10.06726	3.841466	0.0015

Source: Author's calculation using Eviewssoftware 9.

5.9. Interpretation of Johansen Co-integration trace And maximum eigen value

The above table shows cointegration results. Cointegration results show the degree of association between variables. P value of co integration test is 0.0001 which is less than 0.005 its mean all independent variables have association with dependent variable. It tells that variables have long run association. When all variables are co integrated then we apply Vector Error Correction Model (VECM) which tells equilibrium adjustment towards short run to long run.

Table 5.4 Vector Error Correction (Vecm) Model

Variables	coefficient	Std.error	T-Statistic
D(Drop-Female(1))	0.612870	0.09424	6.50354
D(Drop-Male(-1))	0.041669	0.08777	0.47475
D(HH-Size(-1))	0.036592	0.10646	0.34373
D(UNEMP(-1))	0.113866	0.06554	1.73732
D(URBAN (-1))	0.226789	0.11544	1.96454
VECM Value	-0.855142	0.22971	3.72274
R.Squared	0.949017	Mean	0.011724
		Dependent Variable	
Adjusted R.Squared	0.916029	S.D dependent variable	0.378258
F-Statistics	28.76792	Akaike info Criterion	-1.290257

Source: Author's calculation using Eviews software 9.

5.10. Interpretation of Vector Error Correction Model (Vecm)

Table 5.4 represents Vector Error Correction Model (VECM). It contains short run effects of different variables on log of reported crime. If VECM term is negative, then it means that there exists short run disequilibrium in the model which reverts back to equilibrium level in the model. It shows that if there is any short run disequilibrium in the model, 85 percent restores back to equilibrium in the current year.

All the variables reported crime, dropout female, dropout male and urban have correct theoretical signs. Starting with the one and two years lag effects of dropout ratio on current reported crime. It means that if reported crime increases this years, it will falls in next year.

Economic theory states that there is positive relationship between reported crime and dropout ratio. The negative effect at lag one is not observed in economic theory. There are also possitive effects of households saving on reported crime in Pakistan, which is also theoretically correct sign. In theory, unemployment is have possitive effects on reported crime.

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Table 5.5 Granger Causality Test

Pairwise Granger Causality Tests

Date: 04/15/18 Time: 10:48

Sample: 1984 2015

Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
DROP_FEMALE does not Granger Cause CRIME_RATIO	32	NA	NA
CRIME_RATIO does not Granger Cause DROP_FEMALE		NA	NA
DROP_MALE does not Granger Cause CRIME_RATIO	32	NA	NA
CRIME_RATIO does not Granger Cause DROP_MALE		NA	NA
HH_SIZE does not Granger Cause CRIME_RATIO	32	NA	NA
CRIME_RATIO does not Granger Cause HH_SIZE		NA	NA
UNEMP does not Granger Cause CRIME_RATIO	32	NA	NA
CRIME_RATIO does not Granger Cause UNEMP		NA	NA
URBAN does not Granger Cause CRIME_RATIO	32	NA	NA
CRIME_RATIO does not Granger Cause URBAN		NA	NA
DROP_MALE does not Granger Cause DROP_FEMALE	32	6.64518	0.0048
DROP_FEMALE does not Granger Cause DROP_MALE		9.80335	0.0007

HH_SIZE	does	not	Granger	Cause	32	3.19844	0.0580	
DROP_FEMALE								
DROP_FEMALE	does	not	Granger	Cause	HH_SIZE	1.32630	0.2835	
UNEMP	does	not	Granger	Cause	32	0.18625	0.8312	
DROP_FEMALE								
DROP_FEMALE	does	not	Granger	Cause	UNEMP	0.21197	0.8104	
URBAN	does	not	Granger	Cause	32	0.35296	0.7061	
DROP_FEMALE								
DROP_FEMALE	does	not	Granger	Cause	URBAN	2.15300	0.1372	
HH_SIZE	does	not	Granger	Cause	32	2.57652	0.0961	
DROP_MALE								
DROP_MALE	does	not	Granger	Cause	HH_SIZE	1.93989	0.1647	
UNEMP	does	not	Granger	Cause	32	0.92120	0.4111	
DROP_MALE								
DROP_MALE	does	not	Granger	Cause	UNEMP	0.23120	0.7953	
URBAN	does	not	Granger	Cause	32	0.15108	0.8606	
DROP_MALE								
DROP_MALE	does	not	Granger	Cause	URBAN	0.83786	0.4444	
UNEMP	does	not	Granger	Cause	HH_SIZE	32	0.55068	0.5834
HH_SIZE	does	not	Granger	Cause	UNEMP	4.58629	0.0201	
URBAN	does	not	Granger	Cause	HH_SIZE	32	0.18933	0.8287
HH_SIZE	does	not	Granger	Cause	URBAN	2.64326	0.0909	
URBAN	does	not	Granger	Cause	UNEMP	32	4.85586	0.0165
UNEMP	does	not	Granger	Cause	URBAN	1.77964	0.1894	

Source: Author's calculation using Eviews software 9.

5.11. Interpretation of granger causality test

Dropout female does not cause granger causality. Crime ratio does not cause granger causality. Drop out male does not cause granger causality.

Household size does not cause granger causality. Unemployment does not cause granger causality cause. So all variables are unidirectional and have long run relationship.

6 CONCLUSION

“People respond to incentives” is a universal truth that allows us to claim that people participate in criminal activities for their own personal or economic incentives. Backer (1968) introduced the crime and economic discipline by designating criminals and law enforcement agencies as rational individuals. But unlikely crime rate increase day by day but economics of crime have received a little attention. The higher rate of crime increases insecurity, frustration and mental unrest. The study has found significance relationship between crime and economic condition and this study also covers some real implications. The results showing greate positive results between unemployment, male and female dropout, urbanization and household size affect crime ratio in Province Punjab. According to results decreasing the number of dropout directly link with low crime rate in Punjab.

However different other variables also effects crime or increase crime in Punjab. Urbanization and household size effects crime ratio in Punjab. The trend analysis shows that political instability, institutional corruption, unemployment, education and employment policies are the main factors of high crime rates in Province Punjab.

If Government provides more jobs to individuals or establish Rozi schemes it will more decrease unemployment and less unemployment means high enrollment in schools which prevent dropout ratio and also decrease the crime level. This thing is very important because today without a high school diploma an individual’s chance for better life become slow.

There is lack of planning of urbanization. As hundred years ago Marshall (1920) identified the benefits of urbanization like knowledge spillover because of cluster of highly skilled workers. Similarly labour market pooling and specialized suppliers. These are all the benefits of urbanization. But in case of Punjab urbanization causes more crimes. So the reason behind is the unplanned urbanization in Punjab. Because of this

lack of planning resources become scarce, land shortage problem and environmental degradation occur which motivate people towards crimes. Urbanization also increases many problems in society ,like inadequate infrastructure, lack of affordable housing, pollution ,poverty and crime rate. Government should take steps to solve this problem. Govt should provide employment opportunities near rural areas so urbanization must be controlled.

A large Household size brings many problems, in which crime must be considered. A large number of peoples in house mean high consumption, less saving and more part of income used. This size also creates crime, because when people don't have rupees to fulfill their needs they started crime as a short cut way of income.

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Impact of Financial Development and Exports on Industrial Pollution in Middle-Income Countries

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Abstract: In recent decades, undesirable environmental changes have attracted worldwide attention. This study empirically examines the impacts of financial development and exports on industrial pollution by incorporating the role of energy use, capital, and urban population. The data from 74 Middle-Income Countries (MICs) covers the period from 1990 to 2019. In this study, panel OLS, fixed effect model, random effect model, and generalized method of moments (GMM) is applied. The empirical findings revealed that financial development and exports are the contributing factors to industrial pollution in MICs. This study suggests integrating some guidelines to reduce pollution without compromising economic growth. It is also recommended to reduce the consumption of non-renewable energy resources and to reduce the exports of goods that cause pollution during manufacturing.

Keywords: Industrial Pollution, Exports, Financial development, MICs

1. Introduction

Environmental pollution is harmful to all living organisms. It damages the quality of air, water, and land. Pollution is mainly caused by emissions, smoke, and chemicals the industries discharge into the atmosphere (Beil,

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2017; Carrington, 2017). Land pollution incorporates liquid chemical wastage of industries, household trash, and garbage. In this way, industries are inflicting negative impacts on human health.

The middle-income countries are facing the damages of this type of pollution. Industrial activities are the considerable root of air, water, and

land pollution, and leads to disease and sometimes loss of life for human being across the globe. The world is facing the problem of depletion of the ozone layer due to atmospheric pollution. Chlorofluorocarbon (CFCs) contains chlorine, fluorine, and carbon which are damaging the ozone layer by destroying the molecules of ozone from this layer. Depletion of the ozone layer becomes the cause of higher temperatures which leads to global warming.

Pollution from the industrial sector is also causing acid rain by burning fossil fuels, combined with the water vapors in the atmosphere from the acids like sulfur and nitrogen dioxide. CO₂ emissions in surroundings hang on plenty of elements that are responsible for pollution besides the consumption of energy, for example, trade, high-speed pattern of urbanization, capital formation, financial development, industrialization, population growth rate, etc.

Financial development is one of the more representatives that may illustrate pollution emissions. Many countries have focused on financial development to have well-balanced economic growth. In the case of economic development, development of the financial sector is liable for industrial side hazardous waste (Sehrawat et al., 2015). Jalil and Feridun (2011) propose that middle-income countries can obtain new beneficial technology through financial development. Such technological advancements lead to a decrease in pollution. Many researchers pointed out that financial development enables some industries for more

investments and expand their production capacity, potentially increasing pollution emissions (Sadorsky, 2010).

Trade liberalization and economic integration have been the most frequent trends globally. With the augmentation of the World trade organization (WTO), the consequential transformation has been assembled in a global economy. As a result, global trade diversification raises the question of whether trade is beneficial to the environment or not. Consequently, some policymakers and experts are concerned about the effects of globalization on the environment (Barrows and Ollivier, 2014). In the second half of the 20th century, the production patterns of export goods industries changed in middle-income countries. These types of industries include not only traditional production patterns but also move towards capital-intensive industries that lead to the problem of pollution.

The influence of exports on pollution can be revealed using three possessions which are the composition effect, scale effect, and technological effect. In the presence of more export activities, further contributions to the manufacturing of goods are obligatory, which are the sources of substantial carbon emissions in the atmosphere called the scale effect. When economic activity upsurges it increases environmental deprivation which indicates lessened pollution. This thing is upheld through the use of those technologies which are environmentally friendly, recognized using technical effect projected by Grossman and Krueger (1991).

The composition effect justifies growing income which accelerates a rise in demand for cleaner goods. For this reason, firms employ another technique of construction that lessen pollution in the environment. As to the environmental Kuznets curve (EKC) hypothesis, the scale effect dictates the composition effect at a minor income level but as income enhances and touched peak point composition effects controls the scale effect (Halkos and Tzeremes, 2016).

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This study provides the basics for almost all government policies in the system of Middle-Income countries. This study is of great benefit to prospective researchers, and institutions since it will contribute to the existing knowledge and it may open up gaps in the literature, which may oblige an additional exploration. This effort will also be abundant of significance for policymakers who make the policies regarding this zone.

This study is organized as follows: section 1 consists of the introduction and 2 presents the background. Sections 3 and 4 express the theoretical framework and methodology. Section 5 holds the data and variables of the study. Section 6 consists of results and discussions. The last section carries the conclusion and policy recommendations.

2. Literature Review

This section reviews the previous studies to check the relationship between exports, financial development, and industrial pollution. It contains two sections, section 2.1 holds the relation between financial development and pollution emissions. After that, section 2.2 contains the export and pollution emissions nexus.

2.1 Financial Development and Pollution

Shoaib et al, (2020) explored the influence of financial development (FD) on CO₂ emissions. The study aimed to inspect the associations between FD and carbon discharge in G8 and D8 states from 1999 to 2013. Second-generation unit root tests for the panel were employed to inspect the fixed level and to tackle the occurrence of cross-sectional dependency in the panels. The results of PMG and ARDL showed that financial development leads to the release of carbon emissions in the long run. Similarly, Aydin and Onay (2020) evaluated the impact of energy intensity on the association between financial development and pollution in BRICS countries from 1990-2015. Financial development specifies the capacities of the currency of a country that is significant for the countries that import

net energy. The findings of PSTR indicated that there are three energy intensity threshold points. An increase in the financial development index can cause more environmental pollution and vice versa. The experiential investigation of Shahbaz et al. (2020) confirmed that financial development enhances CO₂ emissions for the United Arab Emirates for 1975Q1 to 2014Q4.

Destek (2019) considered the association among financial development pointers, urbanization, income, energy use, and environmental footprint for seventeen developing economies for 1991-2013. The observed results confirm a growing total index of FD and the development of the stock market lessens the pollution while the development of the banking sector and bond markets did not hold a significant influence on environmental degradation. The study by Khan et al. (2019) investigated the link between the usage of energy, deprivation of environment, financial sector development (FD), energy use, and economic advancement for a panel set of 193 countries for 1990-2017. The outcomes of the study state that FD and CO₂ emissions are affected by each other. The consequences of Fitriyah (2019) indicate that financial development, energy consumption, and economic growth are significant factors of carbon emission in the long and short-run in Indonesia.

Li and Ouyang (2019) examined the influence of financial development and human capital on carbon emission intensity in the context of China for the time spanning 1978 to 2015. Firstly, the results of ARDL indicate that financial openness has a positive effect on carbon emissions intensity. Secondly, they establish an inverted N-shaped relationship between human capital and emissions intensity. Likewise, Atil et al. (2018) investigated the factors which influence CO₂ emission in China for 1970Q1 to 2015Q4. The nonlinear ARDL model has been engaged to know the potential asymmetric influence of the elements of carbon emission. The study found that in the short-run, economic growth and financial development (FD) are significant factors of pollution. Bass et al.

(2019) also exposed that FD, real income, and energy use are the significant factors of carbon emissions in Russia by engaging data from 1990 to 2016. Granger causality test discloses unidirectional causality running from FD to CO₂ emissions.

Haas and Popov (2019) conducted a study to find out the impact of financial development on CO₂ emission for a panel of various countries as well as industries for the time of 1990 to 2013. Investigation at the level of the industry reported two stations. Firstly, deeper stock markets reallocate the investment to cleaner industries. Secondly, environmentally friendly technologies are encouraged in carbon-intensive industries. The findings of OLS and 2SLS indicate that FD has a direct impact on industrial pollution and confirms the concave shape of EKC. Similarly, Shah et al. (2019) analyzed the relationship between financial (FD) and the environment by including the role of economic institutions in 101 countries from 1995-2017. The results of FMOLS reported that FD significantly led to an increase the pollution. Later the attachment of economic intuitions is helpful to reduce the impact of FD on pollution. The study confirmed the existence of EKC in the case of income and FD. By the same token Raza et al. (2018) examined the influence of financial development and energy use on the environment in Pakistan. The study used the co-integration test and OLS approach on data from 1972 to 2014. The results of OLS reported that FD deteriorates the environment.

2.2 Exports and Pollution

Yasmeen *et al.* (2019) examined the trade and pollution nexus for thirty-nine countries from 1995-2009. Air pollution was taken as a dependent variable that consists of eight pathways of air pollution. The consequences of the GMM technique explored that value-added trade (VT) increases pollution. The inverted U-shaped hypothesis of EKC in the setting of trade and air pollution was validated in the entire eight air pollutants pointers.

Zamil et al. (2019) studied the trade and CO₂ emissions nexus in Oman. Their analysis concentrated to assess how trade influences carbon emissions by employing the ARDL model for 1972-2014. The consequences of the ARDL bound test indicated that GDP per capita and trade positively increase CO₂ emissions. This means that greater GDP per capita and trade reduce the environmental quality of Oman. Similarly, Mahmood et al. (2019) evaluated the trade and carbon dioxide emission nexus in Tunisia. The study used the ARDL model for the data set consisting of 1971 to 2014. The results of the ARDL model revealed that increasing trade significantly increases pollution. Further, trade has a positive impact on pollution in the nonlinear ARDL model. The findings of Fan et al. (2019) investigated that the increased trade openness reduces CO₂ emissions and that there are evident structural variances in diverse sectors with variant emission intensity in the case of twenty industrial sectors of China.

Sun *et al* (2019) investigated the relationship between trade and CO₂ emissions by keeping the role of economic growth and energy consumption for 49 belt and road countries, covering the years from 1991 to 2014. The outcomes of FMOLS report that trade openness affects the environment. The outcomes from VECM causality displayed a long-run causal effect between trade, pollution, and energy in Belt and Road as well as in high-income, middle-income, and low-income panels.

Qirjo *et al.* (2021) empirically investigated that on average, the adoption of the Comprehensive Economic and Trade Agreement (CETA) can be helpful to combat global warming. According to the estimate, bilateral trade between Canada and EU member decrease yearly per capita emissions of greenhouse gases in an average CETA member. The findings also indicated that yearly per capita emissions of GHGs would be reduced because of CETA.

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Ertugrul *et al.* (2016) worked on the openness and pollution nexus, keeping the role of income and energy in the ten developing countries from 1971-2011. ARDL model for co-integration and VECM Granger causality process were applied for the annual data from 1971 to 2011. The empirical outcomes specify that trade is the contributing factor to pollution in the long run. The EKC hypothesis is validated only for four countries i.e. Turkey, India, China, and Korea.

Ullah *et al.* (2019) argue that China has remained the world's leading emitter of CO₂ while making a considerable contribution to global trade following WTO reforms. Using time-series data from 1990 to 2017, this study investigates that trade has a major impact on CO₂ emissions in the country, resulting in a rise in healthcare expenses.

Afesorgbor and Demena (2019) conducted a meta-analysis of 88 studies to review the trade-environment nexus and the overall effect is determined by three factors: scale, technique, and composition. The findings indicate that trade contributes to greenhouse gas emissions. Only CO₂ emissions are more robust than SO₂ emissions, the finding remains robust when heterogeneity is taken into account.

Hakimi and Hamdi (2020) shed light on the environmental effects of international trade for the panel of 143 economies, observed from 2006 to 2015 by implementing the GMM approach. The study used three models; a combined analysis of an entire sample of 143 countries, and a disaggregated analysis that consists of a sample of developed 43 countries and 100 developing countries distinctly. The results of the aggregated approach show that trade, as a key variable, has no obvious impact on the environment. On the other hand, the disaggregated inquiry demonstrates trade has harmful effects on the environment.

Tariku (2015) argued that trade liberalization stimulates economic growth but may cause to pollute the environment. Johansen co-integration and

ECM techniques were used to inspect the dynamics of time series data for Ethiopia from 1970-2010. The results of this study indicated that economic growth is positively connected to atmospheric pollution whereas, trade intensity is helpful to reduce air pollution.

Fang *et al.* (2020) conducted a study to empirically test the EKC hypothesis and the environmental impact of trade and economic growth for 261 cities in China by using the annual data from 2004 to 2013. They examined two types of pollutants, industrial wastewater, and sulfur dioxide were employed to measure the environment. The consequences of FMOLS show the EKC hypothesis holds not only for the entire economy but also for various zones. Moreover, exports are the contributing factor to reducing the quality of the environment whereas imports improve the environmental quality.

3. Theoretical Framework

A well-established financial sector diminishes the costs of the transaction, lessens the operating threats, and advances the credit network (Tamazian & Rao, 2010). One more predominant element is the financial sector development in the setting of economic advancement which is answerable for industrial pollution (Sehrawat, 2015). The environmentally pleasant technology also lessens the environmental pollutants in the production process (Birdsall & Wheeler, 1993).

The environmental deterioration as an outcome of economic progress can offer some indications of encouraging green progression and supportable improvement. The calculation of the carbon emissions in the export sector uses input-output analysis, which might be a better manner for broadly measuring the consumption of energy and embodied carbon in export and import trade. Many researchers have been employing an input-output method for the analysis of the emission of carbon (Hayami & Nakamura 2002; Davis & Caldeira, 2010; Chen & Hu, 2020; Liu et al., 2011).

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Energy consumption is positively related to pollution. Long-run analysis revealed that the development of the financial sector and energy consumption are directly related to pollution at the primary level (Zafar et al., 2020). Capital formation positively affects economic growth. Financial development may draw FDI by generating commodities that consume more energy and then leads to additional pollutants (Halicioglu, 2009).

In 2014, the world's urban population was larger than 54% and it is predicted to be 66% in 2050 (United Nations Population Fund, 2014). Huge progress in urbanization needs enormous use of energy, construction material, and vehicles which generates pollution i.e. CO₂ and SO₂ emissions. This environmental condition and the increasing trend of urbanization are not good (Uttara et al., 2012; Li et al., 2016; Wang et al., 2020).

The above-mentioned indicators which affect the environment can be written in the following way,

$$IP = f(FD, EX, EN, K, UP) \dots \dots \dots (1)$$

From the coordination of Eq.1, the economic model for the panel of MICs builds up in the following way,

$$CO_{2\ it} = \beta_1 FD_{it} + \beta_2 EX_{it} + \beta_3 EN_{it} + \beta_4 CF_{it} + \beta_5 UP_{it} + \varepsilon_{it} \dots \dots \dots (2)$$

IP = Industrial Pollution

FD = Financial Development

EX = Exports of goods and services

EN = Energy use

CF = Capital Formation

UP = Urban Population

ε = Error Term

Where, the term i is used for countries and t is for the time and β_s are the slope coefficients of the explanatory variables. The dynamic relationship between financial developments (FD), Export (EX), and Industrial Pollution (IP) are examined for middle income during the period 1990 to 2019.

4. Methodology

There are a few techniques that are adopted to check out the linkage between exports, financial development, and pollution along with some control variables for Middle-Income Countries (MICs). Panel ordinary least square (OLS), fixed effects (FE) model, random effects (RE) model, and Generalized Method of Moments (GMM) are applied to estimate the results.

The leading statement of pooled estimation of the OLS technique is the slope coefficients and the intercept do not fluctuate across cross-sectional units over time. The fixed effects model is used to find out the influence of coefficients which can be variants over time. It evaluates the relation among dependent and independent variables for all cross-sectional units because every unit has its attributes that could influence independent variables. FE model controls the influence of time-uniform attributes by empowering them with the unevenness of properties in the intercept.

The random effects model is a suitable approach in case of variation over the structure that has an impact on a dependent variable. It considers time uniform limits. The leading assumption of the RE approach is the intercept of every single cross-sectional unit is randomly strained with the endless average worth of the intercept. GMM approach is also used to tackle the problem of endogeneity and to check the dynamics.

5. Data

This study is an effort to check out the impact of exports, and financial development on industrial pollution. The empirical analysis has been conducted for 74 Middle-Income Countries (MICs) from 1990-2019. The panel data set from 1990 to 2019 has been taken from WDI (2020). The data on industrial pollution (CO₂ metric tons per capita), financial development (domestic credit to the private sector as a share of GDP, in constant US\$), exports (% of GDP), and energy use (kg of oil equivalent per capita), capital (% of GDP) and urban population (% of the total population) have been derived from WDI (2020). This section contains two sections, 5.1 declares the descriptive analysis for the sake of the nature of the variables, and 5.2 displays the correlation matrices of variables.

5.1 Descriptive Statistics

This section carries the descriptive statistics for middle-income countries. Industrial pollution ranges from 0.0084 to 24.3983 while its mean value is 2.4834. The maximum value of financial development is 164.6643 and the minimum value is 2.0104 and 37.1002 is its average value. The mean value of exports is 34.4810 and the minimum and maximum values are 5.083 and 125.7485 respectively. The average value and standard deviation of all the variables are also shown in Table 1.

Table 1: Descriptive Statistics

Variables	Obs.	Mean	St. Dev	Min.	Max.
IP	1980	2.4834	2.7508	0.0084	24.3983
UP	2220	51.8360	19.7698	8.8540	91.9910
FD	1760	37.1002	30.1341	2.0104	164.6643
CF	2111	24.7322	8.5705	-0.6929	77.8900
EN	1612	1106.741	994.1609	9.5480	5941.586

EX	2162	34.4810	18.1452	5.9083	125.7485
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5.2 Correlation between Variables

The results of the correlation show that financial development, exports, energy, and capital have a positive relation with industrial pollution for MICs (Table 2). The signs provide the direction of the relationship in the series.

Table 2: Correlation Matrix

Variables	IP	FD	EN	EX	CF	UP
IP	1.0000					
FD	0.4604	1.0000				
EN	0.8701	0.3689	1.0000			
EX	0.6139	0.3346	0.6208	1.0000		
CF	0.1556	0.1389	0.1077	0.1436	1.0000	
UP	0.7423	0.2151	0.6655	0.4328	0.0316	1.0000

6. Results and Discussion

The empirical findings are presented in Table 3. According to the results of OLS, financial development (FD) shows a positive relationship with pollution which is consistent with the studies of Shahbaz et al., (2016), Mohammadi et al. (2017), and Jiang and Ma (2019). The coefficient of FD shows that a 1% increase in FD causes a 0.2243% rise in industrial pollution. Exports are the main source of economic growth but are also one of the reasons for increasing pollution. Feng (2013) and Wang et al. (2020) also explored a positive relationship between exports and pollution. The results show that energy use is also an increasing factor of pollution and the findings are consistent with the study of Gulistan et al. (2020). The increasing trend of capital formation enhances the level of pollution which has also been proved in the literature by Hina et al.

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(2019). The urban population is the key factor in enhancing carbon emissions.

The consequences of the fixed effects model indicate that the coefficients show that FD, exports, and energy consumption contribute to industrial pollution. The coefficient of capital formation (CF) and urban population (UP) indicate that a 1% increase in CF and UP cause a 0.1199% and 0.5185% increase in pollution. Jiang and Ma (2019) also established the same relationship between financial development, urban population, and carbon emissions. Similarly, the Findings of the random effects model show that financial development (FD), exports, energy, capital, and urbanization are the polluting factors of the environment with the consistency of the findings of Destek (2019).

The results of the GMM model for MICs show that FD and exports positively affect carbon emissions and the coefficients show that a 1% rise in FD and exports cause a 0.05% and 0.11% increase in pollution, respectively and the results are consistent with Bayar et.al (2020) and Feng et al. (2013). Findings also investigated that energy, capital and urbanization are the sources of pollution in MICs, and the results are consistent with the literature (Bayar & Maxim, 2020; Hina et al. 2019).

Table 3: Results of OLS, FE, RE, and GMM Model

Dep. Variable: Industrial Pollution (IP)				
Variables	OLS Model	FE Model	RE Model	GMM Model
IP(-1)				0.3838***
				(0.0000)
FD	0.2243***	0.0849***	0.0873***	0.0528***
	(0.0003)	(0.0350)	(0.0022)	(0.0023)
EN	0.8492***	0.3905***	0.4179***	0.2894***

	(0.0020)	(0.0087)	(0.0079)	(0.0000)
EX	0.0560***	0.1797***	0.1464***	0.1081***
	(0.0432)	(0.0057)	(0.0033)	(0.0001)
CF	0.2015***	0.1199***	0.1233***	0.0824**
	(0.0120)	(0.0011)	(0.0420)	(0.0550)
UP	0.7689***	0.5185***	0.7290***	0.2788***
	(0.0320)	(0.0000)	(0.0000)	(0.0000)
C	-4.7771***	-3.9879***	-4.0330***	
	(0.0000)	(0.0000)	(0.0000)	
N	1067	1067	1067	970
R ²	0.8374	0.8752	0.5065	

Note: P-values in parentheses *p<0.10, **p<0.05, ***p<0.01

7. Conclusion

Exports and financial development not only accelerate economic growth but also have a significant impact on pollution and are expected to increase substantially in the future. The study is an effort to seek an association between exports, financial development, and industrial pollution for middle-income Countries (MICs) for the period of 1990 to 2019. Various techniques are employed to find out the association between the indicators. For the empirical analysis, OLS, fixed effects (FE) and random effects (RE) model, and GMM model have been employed. The empirical findings exposed that financial development, exports, energy consumption, capital, and urbanization are the increasing factors of industrial pollution in the MICs.

Based on the results, the study suggests limiting the negative effects of pollution. The financial sector enhances industrial pollution by the provision of credit to the polluting industries. The pollution-eradication policies should establish that discourage the financial sector from lending to polluting projects. The financial sector can be used as a tool to boost

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economic growth by providing the resources to promote green production. Environmental regulations, along with the supervision of the financial sector can help to ensure long-term development. As the high-carbon exports have an advanced volume in middle-income countries, the government of these countries should recover the carbon emissions by amending the structure of exports. The study also recommends controlling the increasing level of urbanization to control pollution.

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Exploring the pre- and post-COVID lived experiences and preparedness of rural informal healthcare workers: A qualitative study from Pakistan

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Abstract: The purpose of this research is to come up with an impactful understanding of the role of informal rural healthcare workers as an affective and affordable healthcare service provision. The study determines the role of informal health care providers in detecting high-risks diseases such as COVID-19 or other kinds of lived experiences. Secondly, the study explores the adherence of informal health care providers to new methods for the cure of low- and high-risk diseases and impact of such service on patient's satisfaction. The study had followed a qualitative approach by using in-depth semi-structured interviews. Twelve interviews were conducted by selecting rural union councils of Tehsil Shorkot of Punjab, Pakistan. The snowball sampling techniques was adopted to select participants. After conducting interviews, thematic analysis was employed for the analysis of qualitative data. The study's scope is encompassing the role of informal health care providers of rural areas only as they play an important role in filling the gap of limited or non-availability of formal health professionals.

Keywords: Pandemic, Healthcare services, awareness.

1 Introduction

The title of the thesis hints the impacts of informal health care providers in Pakistan after COVID-19. It is also central to search for the role that is being played by these health care providers after the pandemic of COVID-19 in mitigating the emerged panic due to the elusive virus. In addition to this, the current research also deconstructs the mysterious deep-rooted health facilities in the form of informal health providers, which has been neglected in the past. The study targets the informal health care providers who do not have any formal medical degree or certificate from any institutions, but, to some extent, hold expertise in curing the low-risk diseases.

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In views of Inter-Agency Standing Committee (2020), identifying and working with the informal health care providers to spread awareness and expedite the speed of care protection measures, the real role of informal health care providers could be utilized on the face this elusive virus. Understanding local people behavior and perception through the help of getting first-hand knowledge from informal health care providers that they garner after interacting with local people is indispensable key in determining the needed action that must be taken to shape the policy. In short, the hidden potential can be realized by taking some concerted steps by the policymakers. In case of Pakistan, especially with reference to rural and remote areas, the informal health care provider is filling in the gap in the absence of formal health care services or expensive alternative treatments. These informal healthcare providers have no qualification or limited certified qualification/methods to deal with common low-risk diseases. The term ‘informal’ includes a great variety of providers who routinely or occasionally undertake activities for which they do not possess the required medical certification, as assessed by health authorities and/or legislation covering the provision of health services, Bloom (2011). Informal health care providers are: community health worker, compounder, hakeem, healer, herbalist, folk practitioner, folk medicine, lady health worker. On the other hand, formal health care providers are considered those health care providers who possess a medical certificate or degree from an institution.

Main issues that were faced by the people in rural areas are: food insecurity, unemployment, lack of education, lack of medical facilities, unavailability of local transport, and rise in the monopoly of food vendors; thereby, combined these all created a shortage of health resources. Above-mentioned issues compounded the insecurity of mental and physical health which resulted into depression, stress, anxiety, suicidal issues, and crime cases. Then COVID-19 emerged on the screen to make things more severe. It is also known that formal health sector of

Pakistan is not that much strong to tackle the issues. Hence, the need of the hour is to decipher the potential of the informal health care providers.

There is an existence of high-rate disparity in healthcare provision in Pakistan, especially between rural and urban divide. The differences can also be observed in terms of patient-doctor ratio and the huge gap between the elite and the less-affluent marginalized group. The affordable access to healthcare facilities is also a big stigma faced by the society where less privileged people have to face huge opportunity costs in terms of trade-off between basic consumption goods and demand for healthcare services. Therefore, the marginalized group especially in the rural areas must resolve towards informal health care service providers due to easy access and affordability. Hence, there is a burning need of current time to study the gap in terms of limited supply of health care facilities, especially in terms of qualified medical practitioner which is filled up by the informal healthcare practitioners and the impact of these informal healthcare on health outcome. In short, the above lines make necessary to study the role of in the current scenario during the era of the COVID-19. The boundaries of the research are just limited to decipher the role of informal health care providers in the four union councils of Shorkot, Punjab. Informal health care providers are those health care providers who do not have any formal medical degree or certificate from any institutions. Hakeems and Compounder are the main target of this study.

The focus of this study is to decipher the hidden potential of the informal health care providers. The study also focuses on knowing about their role for the treatment of the low-risk and high-risk diseases. In a similar fashion, to accomplish these goals, thorough investigation of the existing literature and interaction with different health care providers will be made necessary. The current study will try to provide a forward-looking approach to curb the menace of the low-risk and high-risk diseases by looking at the issue very keenly from the perspective of rural informal healthcare service providers. These service providers are important from the perspective of rural areas where they feel the gap by targeting the less

informed and less privileged people of the society. The study will provide a case for its replication and a larger scale to be investigated other districts of Pakistan by keeping in view their demographic conditions to reach out to a feasible solution to the respective health issues. The study explores the role of informal healthcare service providers in improving the health outcomes among rural population. It examines the prospects of informal healthcare service providers in detection of high-risk diseases especially after the COVID-19 pandemic as well as the differences in capability of informal healthcare service providers in detecting and curing of less-risk and high-risk diseases. This study also investigates whether informal healthcare service providers facilitate the marginalized group to make informed choices

2 Literature review

The role of informal health care providers is immense. In case of developing countries, informal health care providers play a significant role in tackling health issues. Not only informal health care providers are put aside by the people but also by governments that do not pay much head to the neglected part of health sectors. Moreover, in India, Das, Chowdhury, Hussam and Banerjee (2016) conducted a study to decipher the hidden potential of the informal health care providers, but in case of Pakistan there is dearth of data and the work on this important issue. Therefore, the current study tries to fill in the gap by undertaking a field survey to explore the role of informal health care providers in Tehsil Shorkot, Pakistan.

Most of the literature that targets the informal healthcare service provider are survey-based. The study undertaken by Das et al, (2019) highlights the role of informal health care provision for deeper insights through randomized control trial methods. Sudhinaraset (2013) conducted a study in West Bengal found that two are the most commonly cited reasons for

frequently visiting the informal care providers; the first one is location and the second one is flexibility in hours.

Das et al., (2019) endorsed that there is a lack of evidence about the hidden potential of informal health care providers in India. The study first found gap in the health sector of India, then they started working on the 75 percent of the neglected portion, which was to some extent blessing in disguise for the health sector. In addition, after spending 9 months in the experiment of randomized control trial, they came up with the finding that showed similarities to the concerns of Indian Medical Association. It was suggested that the provision of informal health care providers can be effective as the short-term strategy to improve health care provision, and this also complement critically in ensuring the quality of public sector. On the other hand, Caldwell et al., (2014) endorse that pharmacist are the main helpers in this category as they are easily accessible, and also women health care providers can be of cardinal importance owing to their strong social linkage in the society.

Moreover, according to Sudhinaraset et al (2013), people prefer informal health care provision owing to three reasons: convenience, affordability, and culture. Despite playing an important role, this part of the health sector is largely ignored by the government. Sudhinaraset et al., (2013) study is based on the overview of the literature reviews of 334 articles. It is concluded that the role of informal health care providers cannot be ignored in terms of affordability. According to Feldstein (1970), the backbone of economics development is decreased mortality rate and rise in general level of health. The Feldstein (1970) study highlights how important the health sector is for the economic development. Hence, one can say that neglected part of the health sector should also be highlighted to boost economic development.

In the world of advancement and innovation, there is an uproar in the policy-making circles about the inclusion of people-centric approach to tackle the health issues. In addition, there is much more cacophony on the hidden potential of informal health care providers. On the other hand,

concerns about the quality of service-delivery of the informal health care provider are also challenging. According to the study of Sieverding and Beyeler (2016) on Nigeria, the informal health care providers are the significant portion of the health sector which is not being fully utilized. The study concludes that the role of informal health care providers is vital in providing relief to the poor faction of society. Moreover, while highlighting the role of informal health care providers, Sieverding and Beyeler (2016) further contributes that the role of informal health care providers can be more people-centric if it is not much demanding the unseen geography, alien culture, and distant communities. In short, the cooperation between the formal health sector and informal health sector can be made better by ensuring the quality of informal health care providers which is termed as a key to improve both sectors.

Neto et al., (2021) explored how the Brazilians got rid of the health issues with the help of informal health care providers when it came to handling health issues of the old age patients. About 3.5 million people were in the state of bad health and formal health sector was unable to perform to meet the needs of all. Hence, informal sector played an important role in this regard. The study showed that owing to low risk of infection, low cost, and high emotional support of the terminal ill person many countries recommend short-term solution for patients in the form of informal healthcare service providers. Later, United Health System came up an outstanding idea of converting home care services to emergency services, which also comes into the zone of informal health care provision.

According to Doherty (1985), family centric approach is crucial to combat the disease. The approach holds that there should be systematic working with the family members of patients for prevention, treatment and control of diseases. With the rise of Covid-19, people were advised to stay at home to contain the spread of Covid-19. If affected by disease, they were quarantined and, in that period, the main responsibility was on the

shoulders of family members who had to play role as an informal health care provider.

The story of informal health care providers fits directly to those family members who come to rescue at the time of emergency with traditional knowledge of medicine. Same has been discussed in the study by Chali et al., (2021) that traditional methods of tackling the disease with the self-made medicine that includes the role of herbs. Surprisingly, traditional medicines in the age of advancement are getting more than enough attention when it comes to curing the Covid-19 or traditional diseases, which are not that uncertain as Covid-19 is being considered.

In a similar fashion, there has also been observed a huge decrease in the family-centered care during the pandemic, which remained for a long time on the limelight. The family-centered approach comes under the radar of informal health care providers. Family support was essential at the time of Covid-19 but unfortunately owing to the protocols to contain the virus it all goes against it. On the other side, Hart et al (2020) in their study endorse the needed role of family centered-care when it comes to tackling the elusive Covid-19, and on a similar line, Doherty (1985) argued that family centric is the key in combating pandemic. In addition, the study further put emphasize on the family-centered care as there was not any physical connection feasibility during the pandemic for the medical staff, and on the other side through technology, it was easy to utilize this opportunity to fight against the menace of Covid-19. Furthermore, websites holding enough material, treatment material was also suggested in this case. Apart from this, it was also advised to establish a connection with the family member of patient and with patient as well to make things easy in the uncertain time of Covid-19.

In the United States, according to the Hart et al., (2020) there was not put more reliance on the internet usage owing to its poor facility in some areas, but on the other hand, informal health care giving in the form of family-centered approach was put on the front. The family-centered approach was of cardinal importance as there was no alternative option

left for those who were vulnerable to the virus. In addition, the step was also taken to stop the spread of this disease on a large scale. The family-centered approach also endorsed the need to use more of internet to stop the spread of the diseases.

As it has now become clear that the informal health care providers are the integral part of the health sector, so there is a debate whether, with the help of technology, their role in formal sector can be increased or not. On the other, there had been debate in the past on the ban of informal health care providers, but the reality is something different. According to Sudhinaraset et al (2013) the role of informal health care providers is between 9 to 90% when it comes to interacting with patients, and that depicts how big the informal health sector is, and also it shows how much potential it has. In addition, this percentage increases in low to middle income countries. The informal health care providers are more active in the low- and middle-income groups owing to the disinterested political and economic behavior of stakeholder when it comes to tackling the issues of formal health sector. According to Godlonton and Okeke (2015), a change in political decision-making was observed in Malawi in the form of banning the informal health sector to improve the formal health sector, but it ended up in disappointment because the formal health sector was unable to uplift the bad quality of formal health sector

Part from this, after Covid-19, the world got into worse condition. With a ray of hope after vaccine roll out, new policies were stumbling in the corridors of power to contain virus with stricter measures. According to the Anderson et al., (2021), the rapid roll out of the vaccine would hinder the compliance of SOPs and thereby would create carelessness regarding the humans' behavior towards adherence to SOPs to combat the deadly disease. The study done by Anderson et al., (2021) holds vigilance in the face of changing human behavior with the hope of vaccine appearance in the world. The study further elaborates that when people heard that vaccine had been made then they eventually started to change their

behavior. For all the changes in the behavior, the onus goes to optimism as explored in the study of (Anderson et al., 2021). The academic implication also holds much closeness to the study. After the plethora of bad news, good news triggered a wave of happiness and carelessness in the people, which to some extent resulted into carelessness on every level. In the views of Taylor and Asmundson (2021), after Covid-19, 10-15 percent adults never or rarely wore face mask in the US and Canada, and also there were some rallies against mandatory face mask policies.

After Covid-19, much emphasized was laid on the need of individual's responsibility when it comes to curbing the menace of elusive Covid-19. Bartscher et al., (2021) mentioned in one of the studies about the apparent politicians urge to tackle the issues by belaboring on the individual role. Indirectly, they were aware about the point that social capital must move with the health outcomes. With the rise of Covid-19, governments started advising the people in Europe to follow the lane of responsibility, keeping in view social distancing, and strict hygiene recommendations.

The study done by Bartscher et al., (2021) encapsulated seven European countries, in which the authors observed that the rate of cases is declining as people are following suggestions and recommendations by the government. Here, the role by the government to convince the people proved itself worthy enough to curb the robust spread of the contagious virus. In a similar fashion, in term of theoretical framework role, previous studies also back the results and recommendations, and are proponent of positives outcomes of social capital with health outcome.

As the world is still grappling with the health crisis owing to the menace of elusive Covid-19, and its emerging variants, the question arises that whether the vaccine should be rolled out as an essential medicine for the individuals or not? Ironically, the big bulls of the world are keeping the vaccine's provision in their own zone that is why the poor factions of the world with the help of some super powers are tackling the issue in a lingering way, which is unfortunate to see. The main emphasize in the study by Smith et al., (2021) is on unlicensed vaccine authorization for

emergency and whether that is to be considered as essential medicine or not. According to study International Covenant on Economic, Social and Cultural Rights (ICESCR) Article 12, States have obligations to prevent and control epidemics. Therefore, placing more burden of obligation on the countries who has got into this race and, neglecting the already neglected part of the health sector would not be a good thing, particularly when it comes to tackling the informal health care providers with coercive measure in the 21st century.

3 The conceptual framework

The chain developed in the conceptual framework is further investigated in main themes. In addition, every variable associated with informal health care providers is investigated to navigate the route of research. These themes are developed based on extant literature relevant to the research topic which are then incorporated in the structured interview. Later, the content analysis of the interviews is undertaken in the light of these themes which are conducted in the four union councils of tehsil Shorkot. The variables discussed in the framework depict the association with informal healthcare service providers which is investigated through survey-based analysis. Therefore, the relation of the variables with informal health care providers varies from place to place and individual to individual. These themes reflect the experience of informal healthcare service providers, preparedness for the existing and new diseases, and attitude of patients towards informal health which is compared with pre-COVID and post-COVID situation. Most of the informal health care provider in the pilot sampling were aware about the symptoms of the COVID-19. Not just that they were aware about the symptoms of COVID-19 but they were also aware about the behavior of the people towards preventive and curative measures. Collective attitude of the patients moved in the same direction. Economic condition of the people after COVID-19 was much bad due to which they opted for affordable informal healthcare service in the presence of cough-like symptoms rather

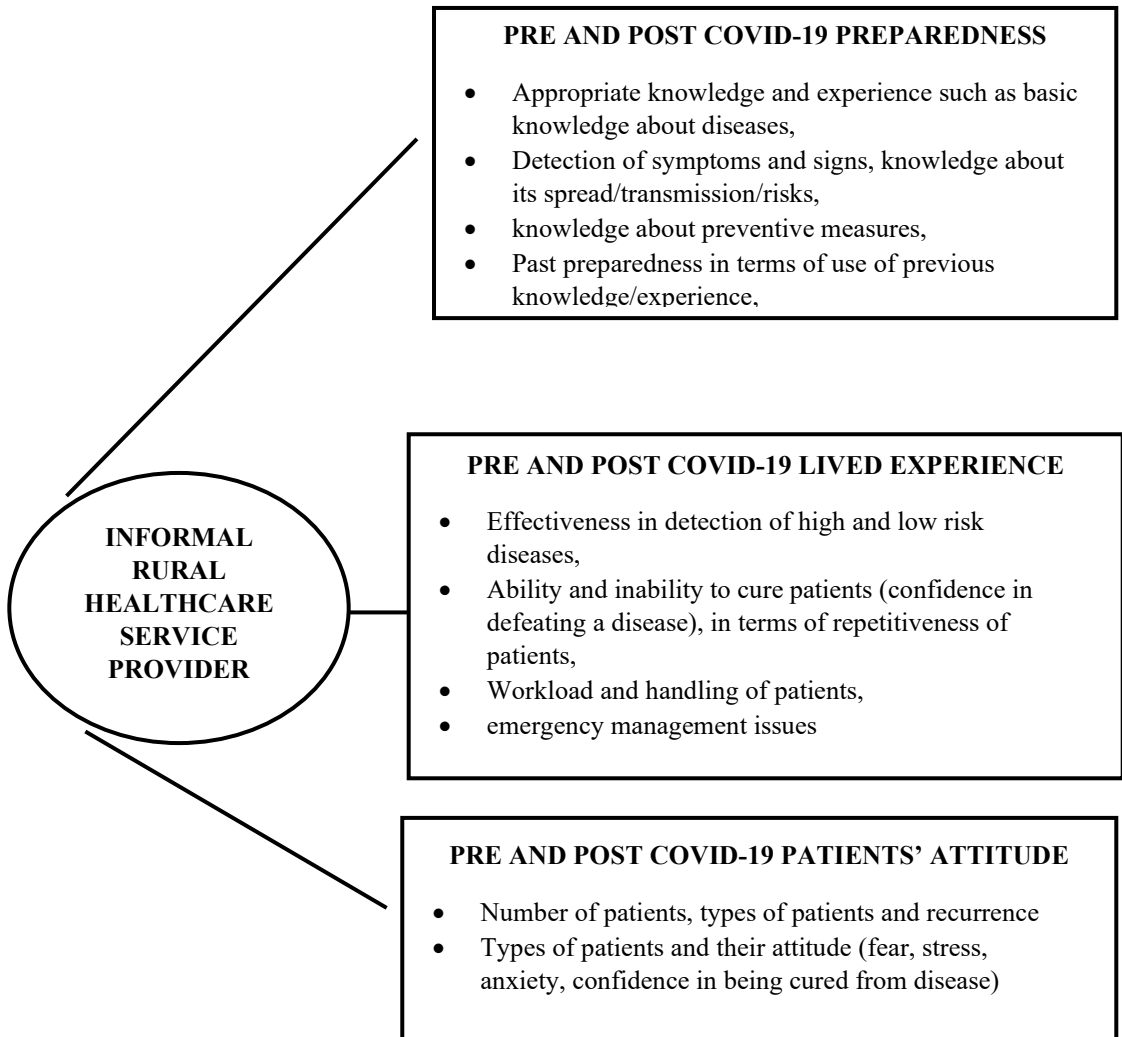
than approaching the formal sector. In addition, there was much fear in the masses owing to the existing conspiracy theories. From the slums of tehsil Shorkot, it was tried best to navigate the route of research in the right direction.

Initially, what the author came to know about the real nature of the research is that there was really need of family-centered approach in the rural areas of tehsil Shorkot. The point of family-centered approach was also endorsed by the Doherty (1985) in the form of family support to tackle low and high-risk diseases. In a similar fashion, the story does not end there. In addition, during the interviews process, one point highlighted most of the time was the usage of traditional methods of treating patients with a low cost. The similar arguments were supported by Chali et al., (2021) that how these traditional methods of treatments can be beneficial to mitigate worries regarding low-risk and high-risk diseases. The author wrote about the traditional methods of treating the patients of COVID-19 because the pandemic was on rise and formal methods of treating patients were disappointing the whole world. In another study, the same arguments put forth by the informal health care providers of the survey were supported by Hart et al., (2020). In a similar fashion, Godlonton and Okeke (2015) in one of their studies supported the arguments presented by the informal health care providers in the interviews that banning the informal sector of health would flourish the formal health sector. Same types of arguments were presented by the informal health care providers that poor economic condition of the people in these union councils is major cause of shift away from formal health sector. Similarly, Bartscher et al (2021) was of the view that individual role in curbing the spread of COVID-19 is essential. Mostly, rural people visit more informal health care providers owing to their less expensive treatment therefore, the above policy line of Bartscher et al., (2021) could be utilized to tackle the diseases.

Three core concepts on which this research is based are i) pre and post covid-19 preparedness ii) pre and post covid-19 lived experience iii) pre

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and post covid-19 patients' attitude. The detailed conceptual framework developed in the study is presented in Figure 1.

Figure 1: Conceptual Framework of the Study

Source: Author's own framework

Linking the conceptual framework with some theoretical background that is contextual to economic thinking, the author of study has categorized it as follows:

- i) **Risk Aversion:** People tend to be risk taker when there is little awareness about the prevailing conditions while in areas that were rampant with conspiracy theories about COVID-19 other than the facts, the wave of fear was much greater, and people were risk averse and paying more visits to the informal health clinic.
- ii) **Moral Hazard:** The informal healthcare providers offers low-cost treatment which also act as an advertisement tool to attract more patients. In some cases, they may offer no cost for a cutthroat competition in the market with fewer service providers. This leads to moral hazard as people's behavior tend to be risk taker.
- iii) **Cost Theory:** The informal healthcare providers brings a lot of easiness for the patients in terms of approach, convenience, and affordability; thereby raising the opportunity cost of formal health sector. In addition, people do not care about the sunk cost as they have no fear of losing too much money. Therefore, the demand of informal sector would remain high particularly in the rural areas.
- iv) **Rational Choice Theory:** The economically impaired people think at the margins more as compared to wealthy. Therefore, such group prefer not going to doctors with the fear of added cost of lab testing and high-priced prescriptions. That fear and easy accessibility to the informal healthcare services motivate people to visit informal sector rather than the formal.

4 Data collection

4.1 Nature of Study: Qualitative Inductive Approach

The approach that was used in the study for analysis is qualitative analysis. An in-depth structured interview is conducted, and the contents of responses are coded keeping in view the three core themes followed in the conceptual framework (Figure 1).

4.2 Data Collection Tool: Structured In-depth Interview

Keeping in view the nature and core themes of the study, the questionnaire was developed using open ended questions. Initially, there was inclination towards making the study quantitative but limitations in getting a relatively large sample size to collect data was not allowing to proceed further. Due to prevalence of smaller number of respondents and the investigative nature of the study the qualitative approach was used for data collection. The questionnaire was designed by first making core themes and multiple variables were identified under each theme. On the basis these themes, the real potential of the informal health care providers is explored an in-depth interview was conducted through face-to-face talk. The ethical considerations for the study was taken into consideration i.e., voluntary participation, informed consent, confidentiality, and result communication. The responses were coded with respect to the conceptual framework developed by the study as presented in Figure 1.

4.3 Sampling

The area for the study was Tehsil Shorkot of District Jhang, Punjab, Pakistan. Particularly, four union councils of Tehsil Shorkot were selected for the interviews. In addition, Hakeem and Compounder were interviewed for the study as who comprised of most of the informal healthcare service provider in these union councils. The study followed the snowball sampling. In addition, it included the in-depth interviews from different union councils of tehsil Shorkot. In a similar fashion, the interviews timing was about 30 to 35 minutes. Apart from the pre-

determined questionnaire, some questions were asked that were aligned with the theme of questionnaire but were not included in the questionnaire to go with the flow of the interview. The respondents were identified through various networking, including gathered information from friends, relatives, and local people. These respondents were of two natures: Hakeems and Compounders, that showed willingness to respond to the questionnaire. Hakeem is a traditional medical practitioner without any formal training or education and the method of healing is based upon cultural beliefs on the medicinal property of herbs or other organics. Compounder is the licensed rural medical practitioner but not a physician with formal medical degree.

Total 12 respondents showed willingness to participate in the study. The duration for data collection was three weeks, from 2nd March to 24th March 2022. While conducting the interviews, the author was helped by a medical student to mitigate worries regarding the medical terminologies and linguistic barriers. Initially, there was some resistance by the workers when it comes to showing willingness to respond to the questionnaire. The snowball sampling was used as the targeted population was difficult to approach due to non-responsiveness and less volunteers to willingly participate in interview due to fear from legal institutions. Through snowball sampling, connections were made to select respondents for conduct of interviews. Thereafter, respondents were asked to make further contacts to facilitate the interview process.

5 Analysis and discussion

The content analysis is done to interpret the first-hand information by the researcher. The data was collected through in-depth semi-structured interview. The interview was conducted via face-to-face interaction of the respondent with researcher by making eye-contact, reading facial expression, and interpreting body language of the respondents. The views

of patients and public about the respondent were not included in the analysis but the perceptions of informal healthcare service provider.

The content of interviews was coded thematically based on the conceptual framework developed in Figure 1. The observations hints toward the increased ratio of patients after COVID-19 even for minor symptoms of illness or physical weakness. This was mainly due to the spread of fear among the community member regarding the pandemic. Moreover, the informal healthcare service providers claimed on having the knowledge to distinguish the COVID-19 patients from others. They collectively claimed that through the support of government they can participate in dealing with the pandemic. However, further analysis is counterfactual to this claim as the content of the collected data suggests that they do not indulge in the emergency cases of high-risk diseases, but they indulge in the emergency cases of low-risk diseases. Table 1 provides the profile of respondents in terms of gender, age, experience, category, and work experience.

Table 1: Background information of the informal rural health care providers

Characteristics	N
Gender	
Male	12
Female	0
Age	
20 < 40	5
40 < 60	5
60 < 80	2
Category	
Hakeem	5
Compounder	7
Experience	
Less than 5 years	1

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6 -10 years	1
11 – 15 years	2
More than 15 years	8
Worked in partnership	
Yes	6
No	6

Source: Author’s own based on field survey

There was a presence of more compounders than hakeems in the study area under consideration. There were two healthcare providers who were above the age of 60 years and rest were equally divided into two age groups of between 20 to 40 years and between 40 to 60 years. Moreover, a greater proportion of the sample included the workers having more the fifteen years of experience. Apart from this, male respondents were selected since they had more impact in the form of large response rate of patients as they were approached more frequently for different types of treatment. Whereas the female informal healthcare service providers in the study area were mainly the midwives who were the traditional birth attendants commonly known as Daii. Therefore, in the perspective of scope of current research female informal healthcare providers were not included in the sample.

5.1 Theme 1. Pre- And Post-Covid Differences in Patient’s Attitude and Behaviour: Types of patients and their attitude (fear, stress, anxiety, confidence in being cured from disease)

The first interview from the Union Council, Qaim Bharwana, was enlightening. The respondent mentioned how economy molded people’s behavior towards the informal sector which is fortunate for the informal health care providers but collectively unfortunate for the people of Pakistan who lack access to the modern health care sector. Other interview from the same union council followed the same chain of thoughts and concluded that poverty levels in the country has forced the

poor people of rural areas to shift towards informal healthcare. Using the snowball sampling, the journey led to another union council named Shah Sadiq Nihang. The respondents in this union council showed some similarity in thoughts to the previous union council.

A male respondent of the union council revealed

“There was no change in the behavior and attitude of the people about the informal health sector after COVID-19.”

Furthermore, the respondent also claimed that during the period of elusive COVID-19, patient behaved with them very well though they came with a lot of stress, anxiety, and depression. This is because people owed them very much, he argued. Therefore, there was not much inclination of the people towards formal health sector. For the increasing ratio, he puts onus on the beleaguered economy, and resistance on the testing system of people prescribed by formal sector to detect the real nature of disease. The respondent claimed:

“During the period of COVID-19 patient behaved with them very well though they came with a lot of stress, anxiety, and depression.”

Moreover, the third interview from the same union council was more interesting. After COVID-19, the respondent reiterated that ratio of patients has increased. The increased ratio of patients is owing to the prevailing fear of expensive treatment of formal sector. In addition, he opinioned on the feedback question that every time patients went satisfactory from his clinic that is why he is still practicing.

From the same union council, there was another respondent who stepped forward to give his insight regarding the existing role of the informal health care providers. For indifference attitude in behavior, he put blame on the negligence of the people who were completely unaware about the COVID-19 symptoms though they had heard about newly emerged disease in the world. On the other side, according to the respondent there

was general fear among the people of his union council, far greater than people coming from other union council. The onus for the fear goes to the conspiracy theories that were existing in the market. While talking about the observation about the society he was of the view:

“People went for preventive measures not for curative measures due to fear of the disease.”

When asked about the shift in the tendency to move towards the formal sector, there was not much difference in the visiting percentage over the period towards the informal health sector. The respondent argued that the people are still attractive towards the informal health care sector. Surprisingly, he was hopeful that the sector will remain prevalent for long period of time because of the abject poverty and inequality of wealth in the society. From the same union council, another respondent came with some new insightful ideas. He argued:

“Initially patients were afraid about the disease but they came again with confidence to them to get the treatment.”

After completing two union council, the next turn for interviews was Bhangoo union council. The respondent was very open to talk about some of prevailing issues regarding the informal health sector. Moreover, according to the respondent, there has been observed that there happened no change in the attitude and behavior of the people regarding COVID-19. The second respondent from the same union council also shared that there happened no change in the attitude and behavior of the people. The reason, he argued, is lack of awareness about the elusive disease. Therefore, he said:

“It becomes clear that people did not go for preventive nor for curative measures as they did not contract with COVID-19.”

In addition, the masses were more concerned about the regular diseases not about the new ones therefore, there was no difference in the percentage of patients visiting to their informal clinics. On the positive note, he added that patients always provided satisfactory feedback to him. Mostly, they came with sweets upon paying a return visit. Such positive notes are the reason that he is still practicing and getting good feedback from every patient. The third respondent from same union council came with an alternative response. Keeping aside other claims, he responded that there is a stark change in the behavior and attitude of the people. Furthermore, he conceded that after COVID-19 people had fear, stress, and anxiety owing to the spread of COVID-19.

In the union council Chak.No. 497, the respondents were also very open to share their thoughts about informal health sector. In the very first interesting interview, the respondent shared that there has not been faced any stark change in the attitude and behavior of the regular change when it comes to talking about their view about informal health sector. They remained indifferent throughout the period. In a similar fashion, he stated that patient behavior owing to the rampant formal health sector is not the same as it was before the spread of COVID-19. He was of the view that patient's tendency toward traditional methods has lost over the period owing to fear of death. In addition, he revealed that people do not fear about the new disease. Sharing his experience of last twenty days, he claimed that he did not face any such thing that showed people have fear about the new disease. He expanded on the question of how people have lost interest after COVID-19. The response was:

“People lost interest on the formal sector because they had fear about expensive treatment.”

He further argued that people did not go for preventive nor for curative measures in the period of COVID-19. Another respondent from the same union council argued:

“There happened no difference in the attitude and behavior of the people regarding the spread of new disease.”

The reason he provided for no difference was that people started believing that COVID-19 did not exist. Further he said that people in the area were of the view that it is government policy. On the other side, in the wave of fear and anxiety, they complained that there was no difference in the behavior of individuals.

Furthermore, he claimed that they cooperated with each other. He revealed that there, in his area, happened a case of death about which people thought that it is owing to COVID-19 which resultantly spread fear, stress, and anxiety in the masses. Moreover, he discussed that the existing fear, anxiety, and depression was due to the previously mentioned death of a lady. Following the same chain of thoughts, the third respondent argued that there happened clear difference in the attitude and behavior of the individuals after COVID-19. The fear in the masses about COVID-19 resulted into a clear surge in fear, stress, and anxiety which they discussed with them upon visit to their clinic/shop.

5.2 Theme 2. Response on the Detection of Low and High-Risk Diseases Pre and Post Covid-19: Detection of symptoms and signs, knowledge about spread/transmission/risks, knowledge about preventive measures

Surprisingly, the first respondent in the union council Qaim Bharwana was aware of the symptoms of the COVID-19 which he came to know through social media and government advertisement policies. Regarding his expertise in the treatment of diseases he claimed:

“I know about Polio virus and about how to cure it.”

The respondent claimed to have treated many diseases over the period of time which include fever, flu, cough, polio, skin-care, and cancer. His response towards key to success is his vast experience. He further

belabored that he has contact with doctors in big hospital, but he never used their methods.

The second respondent also shared that he was aware about the symptoms of COVID-19. In addition, he opined about the people's behavior towards COVID-19 which, he revealed, was not preventive but was curative. He stated that:

“During COVID-19 pandemic, I am using some combination of different anti-biotic to cure the high-risk diseases.”

He further said that he did not use new medicine without first getting details about its working. Regarding the detection of COVID-19 patient, his responded that it is difficult task in his field, therefore, he did not indulge in such matters. The third respondent opened up on the details regarding diseases being treated by him over time that included mostly the liver patient, cough, flu, diarrhea, and cancer. In addition, the feedback of his treatment methods got 60 to 70 percent satisfactory results. Furthermore, he also claimed to use new methods for the treatment of disease occasionally. During the period of COVID-19, he stated that immunization plays a crucial role but he did not try to innovate or create a new thing for the treatment of this elusive virus.

Following the snowball sampling the researcher moved to another union council which is named Shah Sadiq Nihang. The first respondent revealed that he has been visited by a heart patient but he referred him to a big hospital. In addition, mostly he has treated patients with spiritual methods. He further said that he has cured four patients with spiritual methods. Moreover, he was of the view that patients are their advertisement; they came again with satisfaction. He did not try to innovate or create anything new to cure COVID-19 patient.

From the same union council, there was another respondent who stepped forward to give his insight regarding the existing role of the informal health care providers. His response was as follows:

“I do not tackle high-risk diseases and most of the time I cure bone-cracking issues.”

After the treatment, people went with satisfaction, but sometime people also get disappointed. He was of the view that he did not try innovating new methods of cure and has been practicing what he has learned from his ancestors. In addition, he was of the view:

“I do not think this sector has potential to fight with COVID-19”.

Moving ahead towards Bhangoo, the first respondent came up with some more insightful response. Surprisingly, without treating any COVID-19 patient, he claimed that he has ability to differentiate between COVID-19 symptoms and some other regular diseases symptoms, but he also added that it was not in his capacity to treat a COVID-19 patient. His response was contradictory as he claimed to know about the differences between COVID-19 and regular flu but refused to have capacity to deal with the former.

The second respondent from the union council was of the view that he does not indulge in treating high-risk diseases. Mostly, he treats some low-risk diseases and patients go satisfied and come back with good feedback. In the period of COVID-19, he did not treat any patient of high-risk disease. The third respondent came with some outstanding response and mentioned some of the diseases he has treated over the period of time including fever, cough, flu, stomach, and allergy problems. In addition, apart from the inherited knowledge that he got from the forefathers, he did not try to innovate or use new methods to treat new diseases that are being faced by the society.

In the union council Chak.No. 497, the respondents were also very open to share their thoughts about informal health sector. The first respondent said that he had no idea about the symptoms of COVID-19, but he

claimed that through social media he came to know about a little bit about the symptoms of COVID-19. Apart from this, he denied:

“It was not in my capacity to distinguish the symptoms of COVID-19 with other diseases but still I am still optimistic about the future that the sector is not going to fade away.”

Another respondent from the same union council came up with some outstanding insight to give a new dimension to our analysis. Upon asking some questions on COVID-19, he accepted that he knew about the symptoms of COVID-19. He claimed that there has not been any case of COVID-19 in his union council. The third respondent argued that there happened clear difference in the attitude and behavior of the individuals after COVID-19. On the other side, he claimed:

“We detect diseases on the basis of experience.”

Therefore, people have good perception. He very bluntly mentioned that he knew about the difference in the symptoms of COVID-19 and some other regular diseases

5.3: Theme. 3. Deconstructing the Informal Health Care Providers' Hidden Potential and Incorporating Some Pre and Post Covid-19 Changes: Ability and inability to cure patients (confidence in defeating a disease), in terms of repetitiveness of patients

The first respondent from the union council Qaim Bharwana was of the view that he observed some intensity in diseases of cough. In addition, he also tried to treat the patients with some his own old methods of treating the patients. On the other side, second interview from the union council Qaim Bharwana also is of great importance when it comes to tackling the trust of patient. The informal health care provider claimed that people get half medicine then they come to get the remaining half if the result happens in the positive direction. He was much confident about his methods of treating patients that he presented his daughter for sample testing for his medicine. The potential he showed is beyond one's

imagination because he claimed to treat cancer patients. The other two respondent from the same union council did not show that much confidence in the previous two respondents.

The journey of collecting data via snowball sampling comes to another union council which is named as Shah Sadiq Nihang. When it comes to talking about COVID-19, the denied that he did not know about the symptoms of COVID-19. From the same union council, another respondent came up with a claim that:

“I know how to cure the patients with the usage of some spiritual methods.”

Upon asking questions regarding their feedback on the spiritual treatment, he revealed that they came again satisfied from previous experience. He argued that patients are his advertisement. In the union council Chak.No. 497, the respondents were also very open to share their thoughts about informal health sector. Apart from this, he accepted that sometime he treats people free of cost so that people can trust his methods of treatment. Moreover, he claimed:

“Patients always leave good comments after treatment and that make me satisfied about my methods.”

He further expanded that informal sector is less expensive than formal sector. Therefore, patients who do not have the luxury of visiting some big hospital come to him for treatment. He revealed that public perception is good about his treatment; people of his union council trust him. Another respondent answered the question related to the treatment of high-risk diseases, by claiming that he treated a woman who was having some liver issue. Apart from this, he argued that he did not treat any case of high-risk disease.

After shedding light on the treatment of high-risk diseases, he further claimed that most people came to him with good feedback. He further said

that good feedback had motivated him to still work in the field. Moreover, he accepted that he had treated some regular disease over the period, including some diseases related to stomach issues. His response was:

“I receive good feedback from my patients that is why I am still working in this field.”

In addition, he accepted that informal health sector is less expensive, but limited to the treatment of few low-risk diseases but incapable to deal with high-risk diseases. Furthermore, he claimed that despite the growth of formal sector people still came to him for treatment due to poverty. He further opened on the issue that informal sector has ability to tackle some high-risks disease if it is properly supported. Following the same opinion, the third respondent argued that there happened to be clear difference in the attitude and behavior of the individuals after COVID-19 but the informal health sector cannot suggest for tests before treatment. In addition, he is very hopeful about the future of this sector. He believes that until there is poverty is not eradicated, this sector will remain functioning.

5.4 Theme 4. Gauging The Role of Informal Health Care Providers Pre and Post Covid-19: Ability and inability to cure patients (confidence in defeating a disease), in terms of repetitiveness of patients, workload and handling of patients, emergency management issues

The first respondent from the union council Qaim Bharwana claimed that he came to know about Covid-19 symptoms through social media and he argued that it is not difficult to detect the differences between normal fever and Covid-19 fever and the cough as symptoms. In addition, upon asking about the change in people behavior when it comes to making decision regarding the high-risk diseases after Covid-19, he argued

“People had fear of going to doctors because they prescribe them tests before treatment”.

On concluding remarks, he said that he has used some new combinations for treatment that depicts his potential to treat patients with severe diseases. Another respondent from the same union council argued that formal sector present fear of many tests and expensive treatment of the diseases, therefore, people shift towards informal healthcare sector for treatment. The respondent observed that people were more attractive towards this sector due to poverty. On the other side, he mentioned that it was in his capacity to distinguish symptoms of Covid-19 and some other low-risk diseases. Furthermore, he said:

“Government has taken some concerted steps but the economy is not that much strong so people would definitely come to us owing to their bad economic condition.”

The third respondent revealed that he knew about the symptoms of the Covid-19 and was also aware about what kind of preventive measures must be adopted by the people. It was claimed that sometimes lab reports get wrong and that need to be resolved. On the other side, without lab reports he said:

“We hold the capacity to distinguish Covid-19 patients and some other normal patients.”

In the light of above responses, one can easily say that the informal health care providers hold a powerful claim of playing a cardinal role in mitigating the worries of people in the wake of Covid-19 pandemic.

Apart from this, the first respondent of Chak. No. 497 revealed that he knows about the symptoms of Covid-19 and possess the power to distinguish symptoms of low-risk diseases and Covid-19 symptoms. In addition, he was hopeful about the future of this sector and its survival. On the other side, the second respondent showed resistance on answering the question about Covid-19. He commented

I have not treated any Covid-19 patient therefore, I have no idea about Covid-19 symptoms. So, I would not be able to comment on this.

On similar note, third respondent from the same union council also responded of being unaware about the symptoms of Covid-19. Therefore, he further commented on this that the sector does not hold capacity to treat Covid-19 as it lacks modernity in it. Summing up the whole story, the respondent was optimistic about the future of his field by saying:

“The profession of Hikmat cannot be ended as Jalal Hikmat said it will remain till end because it has religious literature in it.”

The first respondent of the union council Shah Sadiq Nehang remained neutral upon asking the question on the symptoms of Covid-19. In addition, he was of the view that people got more attractive towards this sector as they had no money to spend on formal health sector which is comparatively expensive. Furthermore, he said:

“I am unable to distinguish symptoms of low-risk diseases (flu) from Covid-19”

On the other side, he is hopeful that the sector would flourish due to prevailing demand; keeping in view the current economic condition of the people who are more prone to seek informal health service due to affordability in comparison to formal sector. The second respondent was of the view that he has ability to detect Covid-19 patients as he is aware about its symptoms. Concluding his remarks, he argued that if government supports them, they will continue the practice. The third respondent of the same area did not answer the that whether he is aware about the symptoms or not, but he was of the view that if he had a chance to treat a Covid-19 patient, he would have treated the patient with the same methods. About his views regarding the treatment of patients, he said:

“Sector will flourish.”

The first respondent from the union council Bhangoo showed some similarity of the views to the previous interviews. He argued:

“I am aware about the COVID-19 symptoms and people do not opt for preventive measures”.

On the other side, upon asking a question, he said that he is unable to distinguish the symptoms of COVID-19 and some other low-risk diseases. Second respondent of the union council argued that he did not know about COVID-19 symptoms and its spread so he would remain neutral on this matter. Moreover, the third respondent from the same union council revealed that he knew about the symptoms of COVID-19. He also observed that people went for curative measures and they did not wear face masks, and care for SOPs. He further argued that more people got attractive towards the informal health sector in the period of COVID-19. However, he admitted:

“It was not in my capacity to distinguish the symptoms of COVID-19 and some other low-risks diseases”.

In his conclusionary remarks, he was of the view that the informal sector will not diminish with the passage of time as the demand is still prevalent even under the fear of pandemic.

6 Conclusion and recommendations

Concluding the current study on role of informal rural health care providers. It is observed that mitigating the damage inflicted by COVID-19 is not an easy task as against the claims of few respondents whereas majority agreed with the inability of informal health sector. However, the role of informal health care providers holds too much importance in the lives of those people who do not have access to resources. Resultantly, they seek services from this sector to get treatment with meager amount of

money. In addition, it is observed as per the claims of respondents that there is some hidden potential that need to be figured out to avert damages of the future viruses.

On the other hand, there was relief in knowing that without having any formal education; these informal health care providers had a fair idea about the symptoms of COVID-19. In some cases, they even treated some other high-risk diseases and two of the respondents even claimed to have treated an early-stage cancer patient. However, it was difficult to countercheck this claim via a valid proof and was beyond the scope of this study as qualitative data on perceptions was collected. Nevertheless, majority of these informal workers treated the low-risk diseases. The study also revealed that this sector is completely under negligence by the government despite filling the gap of healthcare provision in rural and remote areas where formal care is not prevalent. The larger distance and costly treatment discourage the rural population to approach formal healthcare and such economic conditions is the main reason of prevailing demand for informal healthcare. All of the respondents demanded government support and facilitation. In a nutshell, poor economic conditions and resistance due to expensive lab testing system attached with formal sector keeps the majority of rural population away from the formal healthcare sector.

Based on the researcher's observation some recommendations include government interventions such as legalizing the profession, removing the institutional barriers, and adding marginal value to the existing skills of informal health care providers. Legalizing the profession to work freely without any resistance is indispensable as they are catering to the demand in rural area such as removing institutional barriers that are in the form of raids from different government departments to stop them from working and making it hard for them to get approval for practices. Last but not the least, adding marginal value in their performance by conducting different training camps and programs is necessary since these workers cannot be eliminated from the society as they are very importantly bridging the gap

in rural and impoverished areas. All the above-mentioned measures are possible if there is government involvement.

7 Limitations and future direction for research

The major limitations of this study was the resistance from the informal health care providers to voluntarily take part in the survey due to institutional fear, lack of prior studies on this topic with reference to Pakistan, and lack of availability of reliable data to support and countercheck the findings of this study. Although this study has provided some useful insights with reference to the much-neglected sector, still there is greater prospects for future research in the informal healthcare. The next steps are to encompass the whole sector by including all the potential groups such as quacks, midwives, herbalists, spiritualist. In addition, another important aspect to include in the future research is ‘family-centric’ approach. Further gap that still need to be filled is the unanswered questions raised by this study such as why the informal sector has been put aside by the stakeholders and treated as illegal practitioners despite their relentless services to the impoverished society.

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Testing Employment Growth in the Tourism Industry via Regional Connectivity in Pakistan under CPEC

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Abstract: The bilateral relationship between Pakistan and China became zealous after the agreement of the China-Pakistan Economic Corridor. Among countless benefits, CPEC will flourish avenues for trade and tourism. It is estimated that CPEC will provide 5 million jobs in the tourism industry. Therefore, timely preparation from vocational training centres will reduce the prevailing skill gap. The study aimed to identify potential tourist spots, explore the effect of CPEC road projects on tourism and identify job trades and future required skill sets in the tourism industry. This study utilizes primary data to identify trades and future skill sets in the tourism industry of Pakistan. Furthermore, secondary data has been used to investigate the impact of road infrastructure investment on tourism development with the help of the Autoregressive Distributive Lag Model (ARDL) model. The study concludes that CPEC road projects will develop tourism by boosting robust connectivity. This is subject to a peaceful atmosphere in the territory and good governance. The study also finds various job trades and required skill sets and suggests means to fulfil the skill gap and future employment generation.

Keywords: Road Infrastructure, Travel and Tourism, Employment Generation, Hospitality, Tourist Spots.

1 Introduction

The bilateral relationship between Pakistan and China became zealous after the agreement for building an ‘Economic Corridor’, a framework of regional connectivity in the year 2013. The venture’s initial blueprints

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included establishing links with Pakistan via building a road network, and railways and structuring a robust infrastructure for energy projects and industrialization, with the aim of sustainable economic growth in Pakistan. Among countless benefits, the construction of CPEC eastern and western route from Kashgar (China) towards Gwadar (Pakistan) is a project which may unbolt the avenue of country's economic development via trade and tourism. This mega advertised 11 billion US Dollar CPEC infrastructure project consist of building 1100 km long highway consist of eastern route (i.e. a long motorway construction project between Karachi and Lahore while the Karakoram highway from Rawalpindi to China border will be entirely reconstructed and overhauled) and western route (i.e. considered as more economical in terms of short distance, low opportunity cost and dislocation compensation cost, passes from Gwadar, Turbat, Basima, Quetta, Qila Saifullah, Zhob, Dera Ismail Khan, Mianwali, Attock, Hassanabdal and onwards till Karakoram Highway (Arshad, Iqbal *et al.*, 2018), expected to be done by 2020.

It is projected that the successful completion of all the CPEC projects including infrastructure, energy and Gwadar, would result in giving value of these projects equivalent to 17% of Pakistan's GDP (2015) creating 700,000 direct employment opportunities till 2030 and enhance country's growth rate by adding 2.5 percentage point. Statistics from Pakistan Economic Survey 2014-15 reveals the successful outcomes from initial CPEC infrastructure project, as the volume of trade between China and Pakistan has reached up to 16 billion US\$, whereas China export to Pakistan has risen up by 10% from the year 2009 to 2015. Besides, Chinese tourists have made 140 million visits in Pakistan since 2013 that has improved the statistics of international tourist arrivals in the country. At the operational phase, CPEC routes will become a bridge with the prediction of linking 3 billion people in Asia, Africa and Europe. Furthermore, the road routes and Gwadar port envisages to endorse the economic development of country and become a gateway for Central Asian countries including Afghanistan, Uzbekistan, Iran and Xinjiang for marine transport.

Improvement in World Travel and Tourism Competitiveness Index (WTTCI) from 125/141 in 2015 to 124/136 in 2020 is evident from World Economic Forum (WEF) report because of the advancement in Travel and Tourism (T&T) pillars like infrastructure, business travel, natural and

cultural resources and price competitiveness. The total receipts per arrival of tourist in Pakistan has been amounted to 317 million US\$ in 2020. Moreover, the tourism sector in Pakistan will be a significant economic agent because of its contribution to GDP and employment generation in country and is predicted to raise its contribution in future as well. A brief picture, extracted from WTTC 2017 report for Pakistan, is mentioned in Annex-A Table 1, where successful operation of tourism industry is expected to contribute more than 5 million jobs (including direct and indirect) via industries of accommodation services, food and beverage, retail trade, culture & sports and transportation in the economy along with contributing 39,851.6 million US\$ to GDP by the year 2028.

Parallel to the aforementioned key improvements and recent initiatives for tourism industry, yet Pakistan's overall ranking in Travel and Tourism (T&T) Competitiveness 2020 (124th/136) is not appreciable globally, as compared to the neighboring and South Asian countries like China 15th, India 40th, Iran 93rd, Tajikistan 107th, Nepal 103rd and Bhutan 78th. A country blessed with rich tourism resources in form of enchanting sights for tourist around the world, possess a land which displays ancient Indus Valley, Buddha Civilization, historic forts, deserts, Arabian Sea, stunning Himalayan Peaks, dazzling valleys, famous rivers and kaleidoscope range of culture (Arshad, Iqbal *et al.*, 2018). Besides, Pakistan confronts some serious challenges like terrorism, security and safety issues for international tourists, negative image of country on globe, government negligence towards tourism sector, absence of an organized tourism management structure and inter-departmental coordination, lack of private sector investments, weak enforcement of standards and certificates, inadequate marketing and promotion, and tourism workforce development (Fakhar, 2010).

Projects under CPEC may work as a source of revival of tourism industry in Pakistan. This study is an effort to outline the significance of CPEC road projects in connection with developing country's tourism industry, by

- 1- Identifying potential tourist spots along CPEC eastern and western route.
- 2- Exploring the effect of CPEC road projects (road infrastructure investment) on tourism sector development (tourism revenue).

- 3- Illustrate the major job trades within the relevant industries for future generated employment (5 million jobs) through tourism industry.
- 4- Bring up with some cogent recommendations for unravelling the issues of tourism sector in Pakistan.

The key studies highlighting this dilemma have been discussed in the next section, while the discussion about employed variables and the data description will be reported in section 3. Section 4 of the study will present the empirical strategy, practiced in the current study whereas section 5 includes analysis of the results. Lastly the conclusion and policy directions will be discussed in section

2 Literature review

CPEC road infrastructural projects can benefit the economy of Pakistan via upgrading and promoting tourism industry in the country. Evidence from different regions of the world i.e., Latin America, Spain, Greece and Italy approves that in today's world, tourism industry have a significant role in progressing economic development of a country ((Balaguer and Cantavella-Jorda 2002, Eugenio-Martin *et al.*, 2004, Kim and Chen 2006, Risso, Barquet *et al.*, 2010). Tourism industry has shown up trends in case of India, resulting employment generation and country overall economic and social-cultural development (Mishra *et al.*, 2011). In the case of Pakistan, a study approves that economic expansion plays a necessary role in the development of tourism sector (Khalil, Kakar *et al.* 2007). Another evidence from Pakistan authorizes the long run relationship moving from tourism sector income significantly improves the economic growth in country (Adnan Hye and Ali Khan 2013).

Tourism and economic activities are interlinked in sense that tourism does have the potential to strengthen the national economy as it increases development initiatives (Zhang 2015). Over the past 5 decades, tourism industry emerged as a major growth industry in the world, as it bring improvements in different associated sectors i.e. income and wealth of a region, transport sector, enhancing lifestyle and living standards, international openness, education information, and improve tourism infrastructure (Matias *et al.*, 2007). In respect to employed tourism industry's strength optimally, need of investment is prerequisite

specifically in tourism infrastructure. As development of a region's infrastructure have significant contribution to boost the efficiency of tourism sector. (Jovanović and Ivana 2016). From theoretical literature, it is evident that there is a noticeable relationship between tourism infrastructure investment and tourism development (Adebayo and Iweka 2014).

A transportation system in a host country allow tourist for easy access to tourist destinations, along with a source of inaugural for the new places of interest which are not easily accessible earlier (Van Truong and Shimizu 2017). There is a close association between tourism and transportation accessibility features, that effects the travelling cost spent on tourism of a region (including money and time spend on tours) along with tourism demand (number of tourists) and supply (tourism infrastructure) levels in the country (Sari 2017). Thus, transport infrastructure plays the role of connecting the other two infrastructure, and exhibit potential to promote overall tourism infrastructure. (Prideaux 2000) stated in his study that visitors must have untroubled access to the destination country along with easy reach to sightseers' places.

2.1 Situational Analysis of Pakistan

Observing the latest pattern of tourism and traveling sector in Pakistan, the WTTC reveals that the direct contribution of T&T to Pakistan's GDP in 2019 was constituting 5.9% of the total GDP. In the year 2019, 2.5 million tourists both domestic and international travelled to northern areas alone in Pakistan, while over 600,000 people visited Gilgit-Baltistan in same year. In 2016, the total foreign tourists visited Pakistan were 965,498 while the statistics reveals that in 2014, estimated number of 50 million domestic tourist travel in the country. According to the United Nations World Tourism Organization UNWTO 2018 report, the country acquired 352 million US\$ in the form of international tourism receipt.

Pakistan ranked at 124th position out of 136 nations, according to the report issued by WTTC, 2017. This low ranking is because of poor performance of country in some major measurement sectors like human resource labor market (134th /136), safety and security (133rd/136), environmental sustainability (133rd/136), and government prioritization of T&T (122nd/136). Besides other reasons, the vulnerable situation of tourism industry is because of war on terror situation of country since

2006 including military operations and terrorist attacks throughout the country is one of the major reason (Adnan Hye and Ali Khan 2013), as terrorism does have negative and significant long-run and short-run impact on tourism in Pakistan (Raza and Jawaid 2013). The clear picture of increasing violent terrorist attacks (National Counter Terrorism Authority) happened in Pakistan and downward trend of country in T&T competitiveness index.

2.2 CPEC Eastern & Western Route

The CPEC eastern route will pass through Makran coastal highway, Karachi, Hyderabad, Sukkur, Multan, Lahore, Islamabad, Mansehra, Thakot, Raikot to Khunjarab. The CPEC western route, on the other hand, will pass via Gwadar, Turbat, Panjgur, Bismah, Quetta, Zhob, Dera Ismail Khan, Peshawar, and Islamabad onward. Table 2 in Annex-A fulfills the first objective of our study by discussing the emerging tourist spots, cities and existing details about the attractive points along CPEC infrastructure road projects on both eastern and western route.

3 Methodology and data

Investigating the contribution of investment of transport mode specifically roads in generating tourism revenue is evident from literature. In order to quantify the promotion of tourism sector of Pakistan via CPEC investment in road transport (objective 2 of the study), we collected the relevant secondary level data from different sources. As the CPEC road projects are under construction mode and to this point we are not able to get authentic mastery in this regard, therefore we moved with the proxy variables. The data for the infrastructure investment at current trends and need for road sector, has been collected from Global Infrastructure Outlook for the year 2007 till 2019, used as a proxy for CPEC roads project investment. This data is available annually in US dollars unit. The variable exploited as a proxy for tourism is annual tourism revenue in US Dollar whereas this data is availed from CEIC macro and micro economic data source.

In order to measure the performance of political institutions and governance framework of Pakistan, we collected the country level data from World Governance Indicators (WGI), that gives the information about percentile ranking measurements for six different dimensions of

governance attributes namely Control of Corruption (CC), Government Effectiveness (GE) Political Stability and Absence of Violence/Terrorism (PS), Voice and Accountability (VA), Regulatory Quality (RQ) and Rule of Law (RL) (Kaufmann *et al.*, 2011). The information for WGI has been used as a control variable as literature gives evidence that it has impact on region tourism sector (Dinica, 2009), therefore we involved it in our model of estimation. These indicators consists of numerous specific and disaggregated individual variables evaluating different attributes of governance (Kaufmann *et al.*, 2009). Additionally, the consistency and robustness of these indicators have been widely investigated by policy makers and researchers, hence, utilized these to examine the performance of the government and governance quality of a country (Apaza 2009, Charron 2010, Langbein and Knack 2010, Thomas 2010).

Another relevant control variable we operated in our estimation is Global peace index (GPI) score for Pakistan, acquired online from country economy. It measures the condition of nation's peacefulness from 23 different indicators related to country's internal/domestic and international conflicts, and living condition situation (Index and Peace 2013). GPI is another important determinant of promoting tourism for a region (Pratt and Liu, 2016), that is the reason we exploited this variable in our estimations.

All the variables used for estimation purpose were based on the information for past 23 years i.e. from 1995 to 2019. The exploited variables were available firsthand in unique units. For making their units equal, we standardize the variables and then used them further for estimations. This exercise has done to avoid the problem of multicollinearity and the risk of constructing misleading results or missing some statistically significant expressions.

4 Empirical Model

In order of merit for the study's second objective, we formulated an empirical model to probe the short-run and long-run association between investment in road transport and tourism revenue in Pakistan. This model is estimated through a widely known and voguish Autoregressive Distributive Lag (ARDL) technique, devised by Pesaran and Shin (1999) and Pesaran *et al.*, (2001). The empirical model specification used in our study is given as follow:

$$TR_t = \alpha_0 + \alpha_1 IITR_t + \alpha_2 GPI_t + \alpha_3 WGI_t + \mu_t \quad (1)$$

Where ‘TR’ represents country’s tourism revenue annually in US dollar million, which has been used in literature as a proxy for measuring region’s tourism (Holzner 2011, Steven *et al.*, 2013). The variable of interest in our study is ‘IITR’ which is investment at current trends for transport by road only which has been exploited as a proxy for road building projects under CPEC. Furthermore, GPI is Global Peace Index and WGI as World Governance Indicators information has been incorporated as a control variable because of the reason that these two are the attributes that can effect tourism in a specific region, proved from past literature (Dinica 2009, Pratt and Liu 2016). The specification under the context of ARDL framework takes the following form:

$$\Delta TR_t = \beta_0 + \sum_{i=1}^p \alpha_i \Delta IITR_{t-i} + \sum_{i=1}^p \delta_i \Delta GPI_{t-i} + \sum_{i=1}^p \theta_i \Delta WGI_{t-i} + \sigma ECM_{t-1} + \gamma_1 TR_{t-1} + \gamma_2 IITR_{t-1} + \gamma_3 GPI_{t-1} + \gamma_4 WGI_{t-1} + \mu_t \quad (2)$$

Where β_0 and μ_t is a drift and white noise respectively, while the segment of equation with γ_i is associated with the long-run relationship. In this case, the F-test is executed to check whether the long run relationship exists or not. Here, the null hypothesis of the equation is $H_0: \gamma_1 = \gamma_2 = \gamma_3 = \gamma_4 = 0$ where as $H_1: \gamma_1 \neq \gamma_2 \neq \gamma_3 \neq \gamma_4 \neq 0$.

For ARDL bound test, the calculated value of F-statistics is matched with the upper and lower bounds critical values as mentioned by (Pesaran *et al.*, 2001) where as if the calculated value of F-statistics is greater than the upper bound critical value we will reject the null hypothesis of no co-integration. Besides, the Error Correction Model (ECM) test which shows the pace of adjustment to long run equilibrium after a short run break is estimated with the following equation.

$$\Delta TR_t = \beta_0 + \sum_{i=1}^p \alpha_i \Delta IITR_{t-i} + \sum_{i=1}^p \delta_i \Delta GPI_{t-i} + \sum_{i=1}^p \theta_i \Delta WGI_{t-i} + \sigma ECM_{t-1} + \mu_t \quad (3)$$

5 Results

We start our empirical analysis by explaining the order of integration for considered variables of our model. Standard Augmented Dickey Fuller (ADF) test is used in order to assess the presence of unit root in the variables. Table 5 in Annex-C, illustrates the results that the order of

integration for all the exploited variables is either I (1) and none is I (2), so we can move with ARDL modeling for our data.

To find out the long-run relationship we will proceed with the foremost step of selecting lag-length for our model equation 2, as the outcomes of long-run relationship are responsive to lag-length selected (Bahmani-Oskooee *et al.*, 1991). Since the data that we exploited in our study is annual data that is why the length for lag is restricted for shorter period (Siddiqui *et al.*, 2008) or till 4 lags. From the unrestricted VAR approach the results suggested that all the lag selection criteria (including Schwarz, Akaike, Hannan-Quinn and Final prediction error) shows lag 1 as an optimal lag for our model. Afterwards we proceeded towards the co-integration test by estimating the Eq. (2) with lag 1. The value of F-statistics for all the covariates is shown in Table 6 in Annex-C, along with the 5 % critical upper and lower bound values. It is evident that the calculated F-statistics for our model is greater than the bound value which shows that there exists a long run relationship among the variables used in Eq. (1) when the “TR” is dependent variable, and all other covariates lies on the independent side of equation.

In the next phase, ARDL model has been utilized to compute the long-run and short-run estimates of Eq. (2). Table 7 in Annex-C exhibits Breusch-Godfrey serial correlation LM test to check serial correlation, whereas the value F-statistics approved that our model does not have serial correlation issue. Besides, the findings of table includes the value of ECM estimated via Eq. (3) mentioned as ECM_{t-1} showing negative and significant value that means there is a strong co-integration among variables and the short-run break in equilibrium can get adjusted in long-run. The F-value for Heteroskedasticity test state that we will accept the null hypothesis that our series is homoscedasticity whereas serial correlation does not exist in our model as stated from the F-statistics value which is insignificant.

Table 1: Estimated ARDL Model, Long run Coefficients and Short run Error Correction Model.

Regressors	Coefficients	Standard Error	T-ratio (prob)
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Panel A: Estimated long run coefficients

IIRT	0.06	0.36	0.15 (0.88)
GPI	1.58	0.45	3.48 (0.00)
WGI	1.31	0.52	2.51 (0.02)
Intercept	0.65	0.32	2.03 (0.06)

Panel B: Error correction representation with short run coefficients

			-1.95 (0.07)
Δ IIRT	-0.14	0.07	
Δ GPI	0.07	0.08	0.74 (0.46)
Δ WGI	-0.07	0.08	-0.85 (0.40)
Δ Coint Eq(-1)	-0.23	0.04	-5.02 (0.00)

Panel C: Diagnostic Tests

Prob. Square	Chi-
Breusch-Godfrey Serial Correlation LM Test	0.55
Heteroskedasticity Test: Breusch-Pagan-Godfrey	0.23

Note: The dependent variable is tourism revenue. IITR is investment in transport by road, GPI is global peace index and WGI is world governance index.

Table 1 illustrate the results of the estimates i.e. findings for long-run and short-run relation between investment in transport by road IITR and tourism revenue TR. Keeping insight the outcome from long-run equation, the coefficient of investment in road transport holds positive sign which is statistically insignificant. This indicates that investment in transportation sector increases the tourism opportunities up till a certain extent. After meeting the desired infrastructure, other executive institutions has greater importance to attain the optimum output from tourism sector like robust policies, transparent implementation of rule and law and existence of prosperous environment for international tourists. As mentioned from the

results of control variables, i.e., WGI and GPI, there exist a positive and significant association of both variables with tourism revenue. The coefficient of GPI and WGI is positive and significant in long-run results showing that one unit increase in GPI score and governance indicator score will increase the tourism revenue up to 1.58 and 1.31 dollar respectively.

In contrary, we have observed a negative relation between investment in infrastructure and tourism, which is statistically significant. This indicates that advancement in tourism sector is considered as a dynamic intervention in an economy which is achieved only after meeting certain predefine structural changes in which infrastructure is considered as a component. Therefore, in the short run, investment in infrastructure may negatively affect the tourism industry but after sometime it will have a positive impact, as observed from our findings.

Summarizing the results, we conclude that in case of Pakistan, providing better road infrastructure may help to generate the tourism revenue via boosting up a robust connectivity of different regions in country and eminence access to the magnificent sites for tourists. An unchallenging approach to tourist destination would outcome with facilitating the tourists with a memorable tour and help to generate the repeat visitors as well. Example of Bosnia & Herzegovina and Shaanxi & Guangxi (China) exposes that the main deterrent in the development of tourism sector was poor road infrastructure quality which kept the tourism sector ungraded and low number of tourists (Tisdell and Wen 1991, Lugonja 2014).

In addition, peaceful atmosphere in the territory is obligatory to boost the tourism industry of any region. The results show strong significant and positive results which reveals that non-violence environment is prerequisite for attracting the tourists and attaining economic benefits from the existing tourism resources in the country. An example from Spain divulges that incidence of terrorism affects tourism industry in country badly by scaring away 140,000 tourist between the year 1970 to 1988 (Enders and Sandler, 1991). Parallel results has been observed from a literature which shows that around the world the terrorist attack incidents has vulnerably affect the regions tourism industry (Pizam and Smith 2000).

Likewise, the role of governance is vital in sense of making tourism endorsing policies, providing a vigorous management structure and enforcement of standards for quality output from tourism division. As the results of our study significantly agrees that robust governance would result in increasing the tourism industry output. These results are in accordance with the discussion held in section 2.1 where over the time period, government policies and its valiant initiatives for upgrading tourism industry in China has explained explicitly.

5.1 Discussion

The tourism industry is a wide notion with different affiliated industries like food and beverage services, accommodation services, transport services and some others like sports and culture (WTTC 2017). To understand the major employment trades under tourism industry, the two major sectors i.e., hospitality and tourist agencies has been considered in our study. The major job trades and their description has been acquired from the literature, Pakistan Bureau of Statistics Manual 2015 (PBS), interview of relevant resource persons and desk review of sources mentioned along for achieving objective 3 of our study. The details of job trades under hospitality sector and traveling agencies are mentioned in Annex-B Table 3 and 4.

Universities and vocational institutions in Pakistan are responsible for providing education of tourism management and required skill sets for tourism industry. Currently in Pakistan, almost 53 universities are covering “Tourism” as a subject and offering different courses (at Bachelors and Masters level) in the respective field, follows the similar curriculum and also follow the same core subject applications to that of a business degree, however along with a special attention on tourism and hospitality management (i.e., 66 % of total institutes are offering degree level courses in tourism and hospitality management). So, the prima job demand in the tourism sector is for tourism and hospitality management in Pakistan. This is because; mainly the tourism and hospitality industries are some of the largest companies in the world so there is an increasing demand for tourism graduates along business management skills and training and hence this degree is of a great importance. Besides, some vocational institutions are also operating to prepare the required skills for the tourism industry demand. For instance, National Vocational and

Technical Training Commission is conducting a 6 months course of House Keeping and Cooking Chef, Technical Education and Vocational Training Authority is holding professional Cooking Courses for the trainees whereas a private sector renowned organization Hashoo Foundation is playing a vital role by offering numerous standardize courses around the country for Reception Operation Manager, Accommodation Operation & Services, Restaurant Manager, Food Preparation and Culinary Arts (Cooking/Patisseries), Hotel management, Basic Housekeeping and Laundry Management, Front Desk Manager, and Food and Beverages Services.

6 Conclusion and Recommendations

Progressive strategies and policies are needed for tourism management and its development in Pakistan, which should help to strengthen the economy of country by creating employment, driving exports and generate prosperity across. Developing tourism and traveling (T&T) industry will lead to markup the GDP via increase in internal spending by local resident, nonresident and government on T&T activities, boost in investment activities like construction of restaurants, motels and hotels, infrastructure advancement and rectification of transportation system, and raising the employment opportunities by introducing the advance skills needed in executive and managerial level. The study may provide key guidelines and awareness of the creating upward shift in tourism industry by exploiting best road infrastructure through CPEC road projects and promoting the highlighted tourist spots along CPEC road route.

Communication infrastructure is one of the important ingredients of tourism equation. Making mode of transport worth traveling with improved services and good quality i.e., no traffic blockage, paved road, easy access to the tourist destination and road safety equipment's would facilitate tourists and attract them for repetitive trips as well. Rapid efforts of constructing paved wide road along with road safety lights/slogans and road sidebars is needed to control the worse situation of traffic in the northern tourist spots areas and the accidents.

Accommodation issues has also been observed during recent years because of upsurge tourist arrivals in the northern areas of Pakistan; only in Gilgit Baltistan the accommodation capacity has rose up to 9000 beds whereas the available capacity is not enough. It is therefore recommended

to the Provincial governments to take measures for building accommodation infrastructure according to the exact demand of tourists by keeping a deep insight of total market demand and supply.

The great existing potential of tourism in country can contribute to the employment enhancements and sources of many jobs for the unemployed masses. For the notion of direct job trades mentioned in table 3 and 4, it is advised to develop dynamic international standards curriculum along with new universities and training institutes of tourism and hospitality management for focusing on the academic effort and research work in the field of tourism management and its upgradation. Furthermore, there exists an aptitude of diverse business and employment opportunities for the local masses via tourism promotion in the industry of handmade carpets, embroidery cloths, textiles, wood and metal work, food and taste, jewelry and the promotion of local cottage industry (Fakhar 2010). This would contribute to uplifting the social and economic condition of the rural areas of Pakistan exhibiting poor masses.

Pakistan Tourism Development Corporation PTDC role has been fadeout after 18th amendment even the organization is facing serious financial and authority issues where the authorities have been given the province for managing tourism sector individually as, Tourism Development Corporation Punjab (TDCP), Tourism Corporation KPK (TCKP), Baluchistan Department of Culture and Tourism (BDCT), Sindh Tourism Development Corporation (STDC) and AJK tourism Department. This has reduced the participation of country in international tourism promotions festivals, mismanagement of allocated funds, hiring of unprofessional and non-technical masses, competition with private sector, and therefore, lacking proper planning and performance. Therefore, there is a need of establishing the Pakistan Tourism Board on national level or a Ministry for Tourism Industry organized under the board of directors.

Beside all of the above recommendations, from the study empirical results it is suggested that there is a need of secure environment for the local and international tourists which is essential to elevate the tourism industry. Conducting regular workshops, seminars and conferences in educational institutes, local and regional public platforms about bringing peace and harmony through tourism promotion along with using electronic print media to cease the internal conflicts and exalt the tourism would lead to

post a positive image of the country worldwide. Virtuous management and strong role of public institutions for Pakistan's image building as tourist destination through international and domestic marketing/promotion, inter-provincial coordination for proper planning and functioning framework, extensive research and development in the field of tourism in Pakistan, implementation of international standards, classification and proper licensing of relevant sub industries under the title of tourism, is prerequisite. Moreover, strong stance of government is required in order to eliminate public officials malfeasance within the corporation and incompetence or political base hiring's instead of worthies individuals in order to enhance the productivity of the all the organizations lie within the notion of tourism industry.

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Does Green Human Resource Practices have any impact on Environmental sustainability in Manufacturing Sector of Pakistan?

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Abstract: The term “Green HRM” refers to the blend of environmental management into human resource management (HRM). This study focuses on green human resource elements like employee empowerment and environmental management systems. 430 employees (360 males and 70 women) from five renowned Pakistani manufacturing companies completed self-administered surveys (listed on Pakistan Stock Exchange Manufacturing Industry). Demographic descriptions and questionnaire for qualities that are both independent of and dependent on the study’s outcomes are included in the findings. The reliability presumptions were validated prior to performing a regression analysis to assess the hypothesis. According to the study, developing countries like Pakistan should integrate more environmentally friendly practices into their systems of Human Resource Management.

Keywords: Green HRM, sustainability, commitment, empowerment, manufacturing sector, Pakistan

1 Introduction

The United States needs GHRM practices because it is a developed and developing country. Despite the fact that developed countries are conducting a growing amount of research on GHRM, administration should emphasize environmental protection policies at all levels. The impact of GHRM practices on Pakistani companies’ long-term sustainability. For you to get the maximum performance out of your workers, you must provide them with emotional and psychological

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support. If you have strong sense of self-worth and confidence, you'll have a better chance of succeeding at work.

Individuals and organization can be empowered if they can make and implement effective decisions. According to this theory, increasing employee satisfaction may be accomplished by giving individual ownership and responsibility for their own work and the repercussion of their activities. Certain businesses have found that empowering employees is a successful strategy (Ahmad 2015). The use of this unique management method may boost a company's efficiency and worth. Individuals gain a sense of self-assurance and self-worth as a result of this method, which encourages them to experiment with the new ways of doing things at work.

In both theory and practice, we have a shaky grasp on the concept of management. Most administration professionals agree that empowerment is a crucial component of many administrative methods. An effective manager is more than just a boss, he or she is also a facilitator and an agent of empowerment, as evidenced by the growing body of research. The concept of empowerment, which can be interpreted in numerous ways can be used to reject the Tylor and Ford executive model. According to Theory X, money concerns irritate representatives.

In Theory Y, human existence is viewed as an idealistic route toward betterment. The term "empowerment" has taken on many different meanings over the years, and it is still used today. In 1970s, the quality of working life (QWL) movement coalesced and evolved around these issues. It is useful to be aware of numerous strategies for empowering people. Knowing about different approaches of empowering people is helpful. Those at the top of the hierarchy may feel more independent as a result of their empowerment. This model was developed by Thomas et al. (76). According to this school of thought, social traits like intensity assignment, data sharing, and asset sharing are just a few elements that may help in the future growth and sustainability of the empowering process. According to Conger, J. A., "A way for developing an individual's conviction in their own self-sufficiency" (76). (Barney 1991),

The approach has allegedly been enhanced in three ways, according to its developer. You have a wide variety of interpretative methods to choose from.

The twenty first century has seen rise in the appeal of environmental issues among people from all walks of life, including those who are not actively involved in government, open society, or economic sector. The GHRM model consists of component including vision strategy, environmental performance evaluation, and incentive activities. It is impossible to exaggerate how important environmental issues are to business. The importance of long-term viability in evaluating human resource management is rising (HRM). Most important component of sustainability is Green Human Resource Management. (Jabbour, Sarkis et al. 2019). The company's overall CSR plan includes a small portion of the environmental sensitivity of human resource management. Additionally, the investigation seeks to comprehend a number of crucial GHRM activities better. Management programs are carried out using human resource policies.

1.2 Research Gap

Expert investigations are conducted by specialists.

Deficiency: There is still a lot of uncertainty over how to apply green HR management practices in industrial organizations, despite the wealth of knowledge that is readily available. To find out more about how green policies are applied in the industrial sector, we consult the literature on the HR components of GHRM. The purpose of this research is to look at the influence of green HRM practices on industrial organizations. Despite the GHRM's importance in maintaining a healthy work environment, many professions disregard it. The investigation's objectivity has been questioned because of a lack of resources and time. As a result of the study's non-generalizability, the sample size is also restricted to industrial firms.

1.3 Objectives

The objectives for this session are as follows:

To determine whether an organization's environmental commitment can be upheld, a Green Human Resource Management strategy can be used.

Using a green HRM technique, we may evaluate how employee empowerment impacts environmental sustainability.

1.4 Research questions

Take a look at the research questions below:

Is there a link between management commitment and environmental sustainability when it comes to GHRM practices?

Is there a link between GRM practices and employee empowerment that is also environmentally sustainable?

1.5 Hypotheses

Our purposed hypotheses are given below:

Management commitment has minimal influence on an organization's long-term viability as a GHRM practice. Management commitment as a GHRM practice has a significant impact on a company's long-term viability. As a long-term GHRM approach, empowerment has little influence. The GHRM method of employee empowerment has a major effect on a company's long-term success.

2 Literature review

It tries to make a connection between Green human Resource Management and environmental performance. Analysis reveals that work life balance is significant mediator by which GHRM influences environment performance. Organization must implement comprehensive policies and programs. To establish a green balance, all stakeholders at all level should collaborate. For policies to be implemented effectively, there should be a strong synergy of GHRM and environmental practices (Masri and Jaaron 2017). It has been discovered that employees who are heavily reliant on environmentally friendly activities in their workplace contribute significantly to environmental performance. To create the green balance in an organization, no prior in-depth knowledge or expertise is necessary, but making an effort can aid in improving learning and identifying

chances to practice sustainability and achieve the green environmental balance (Mishra, Sarkar et al. 2014).

Due to rising public concern for the environment corporate organizations are being compelled to alter their business models in order to embrace green human resource management (Tariq, Jan et al. 2016). The majority of manufacturing companies have realized how important green innovation is to their success. Despite the potential contribution this study line might make to green management studies, green human resource academics have ignored it (Muisyo, Qin et al. 2021). The results clearly shows that GHR practices, such as employee engagement and leadership, recruitment and selection, training and development (green abilities), rewards and compensation, and performance management, have a significant positive effect on the firm Green Competitive Advantage (GCA). Additionally, businesses that engage on Green Innovative Culture (GIC), such as green product innovation (GPDI) and green process (GPRI), support their GCA. Article also demonstrates that companies that mix GHRM with GIC achieve higher GIC than those that solely employ GHRM.

The paper examines the linkage between Green Human Resource Management (GHRM) and the literature on sustainability as well as recent conceptualizations and theorizing of GHRM (Mukherji and Bhatnagar 2022). The study's conclusions have significance for GHRM assessment and study design in the area of human resource management (HRM)-environment-sustainability-responsibility, which has not been well studied. The study is supported by the literature on the impact of environmental related HR activities on fostering long-term competences and enhancing firm-specific social outcomes. The study also finds that GHRM has a different impact on organizational sustainability depending on the viewpoints used in conceptualizing it (Daily, Bishop et al. 2012), which supports GHRM's growing recognition as a crucial tool for organization to demonstrate their commitment to being accountable stakeholders in socioeconomics system.

The article underlines the need of integrating GHRM practices and culture at work in order to foster good green behavior in employees and raise the environmental performance (EP) and business performance (BP) of the company, the article emphasizes the necessity of integrating GHRM

practices and culture at work (Ghouri, Mani et al. 2020). This study evaluates the essential elements of GHRM and look at how it affects both the business and environmental performance. The study revealed a substantial correlation between GHRM and EP as well as correlation between EP and BP. In addition, EP strongly modulates the interaction between GHRM and BP.

Around the world, there has been an overall increase in environmental impact-related anxiety. The organization's agenda now places a high premium on environmental conservation and the adoption of environmentally friendly methods (Jackson, Renwick et al. 2011). Organizations, both public and private, have started to focus more on their green elements because doing so will increase their sustainability and hasten the transition to a more circular economy (Marrucci, Daddi et al. 2021). The investigation if the connection between GHRM and the circular economy is only beginning. Moreover, it adds to the body of scholarly work on the influence of GHRM practices on economic and environmental performance. The impact of GHRM efforts on how various stakeholders view an organization's environmental reputation was also examined. The study's conclusion adds to the scholarly debate surrounding the implementation of GHRM techniques.

In order to apply Green HRM in research, there is an increasing demand for environmental management to be incorporated into Human Resource Management (HRM). Through the application of environmental management systems, the study seeks to ascertain the relationship between green human resource elements such as management commitment, employee empowerment, feedback and review, incentives, and exit with sustainability {Mahmood, 2016 #14}. The study has investigated how GHRM practices affect the sustainability of manufacturing enterprises in Pakistan in the context of management philosophy. Major advantages of GHRM practices include growth in employee retention rates, advancement of public perception growth in attracting better personnel, improvement in efficiency and sustainability, reduction in ecological effect if organization, increased productivity, and enhanced overall performance. The success of green HRM depends on the HR

managers' activities and evaluations following unique and recognized patterns. The importance of Green Human Resource Management practices is effective to support employee confidence, according to empirical data, and this may help in achieving significant benefits for the business and employees.

The research article intended to investigate how company environmental strategies and a green psychological environment influence workers' pro-environmental behavior. Additionally, the modifying effect of environmental consciousness, which was largely disregarded in earlier studies, is investigated. In the Punjab, Pakistan, health sector, quantitative research techniques were employed, and data were gathered utilizing a standardized questionnaire. The results indicate that the association between Green Human Resource Management and environmentally friendly mediated behavior by company environmental strategy and a green psychological climate. Management commitment has minimal influence on an organization's long-term viability as a GHRM practice. Management commitment as a GHRM practice has a major effect on a company's long-term viability. As a long-term GHRM approach, empowerment has little influence. The GHRM method of employee empowerment has a significant impact on a company's long-term success. Additionally, certain HR practices have a greater influence than others on the business environmental policy. For a better workforce that is environmentally sensitive, greater attention might be given to the extremely crucial GHRM practices. The healthcare industry in underdeveloped nations may focus their meagre resources on important green human resource policies that will encourage their workforce to operate in a more environmentally friendly manner.

The goal of study is to determine how environmental performances are improved by employing Green Human Resource Management techniques by encouraging employees to act in ways that are friendly to the environment. Additionally, it evaluates the largely unnoticeable moderating effect of environmental knowledge between pro-environmental behaviors and organizational environmental performance. According to the analytical results, Green Human Resource Management practices and company environmental strategy are favorably associated to the psychological green environment, which in turn encourage employees to adopt environmentally friendly behaviors. The outcomes also illustrate the specific formulation of a strategy at the corporate level to encourage

staff members to build a green workplace that would improve environmental performance. Results also suggest that environmental performance and pro-environmental behavior are moderated by environmental knowledge. By making business environmental strategy one of the primary predictors of pro-environmental behavior and environmental performance. This research offers crucial practical implication to top management and policy makers for achieving environmental performance through corporate environmental strategy and by implementing Green Human Resource Management.

How the university's environmental performance is impacted by green HRM this study was conducted. The study also examines the role that pro-environmental attitudes and actions play as mediators. Additionally, the aim of the study is to ascertain how the relationship between environmental commitment and pro-environmental conduct is influenced by green self-efficacy. The findings of the study suggested that human resource management strategies may alter employee behavior, which would eventually impact the organization's environmental performance. Additionally finding shows that the association between green commitment and pro-environmental behavior is moderated by green self-efficacy. This study highlighted the degree of dedication of the university staff and self-efficacy, which is advantageous for enhancing the institution's environmental performance. The report provides information on green human resource management strategies that are used in higher education. In order to improve a environmental performance of university, it highlights the critical significance that environmentally conscious conducted on the part of academic staff plays. The subsequent research focused on the growing idea of "green human resource management" as a collection of activities aimed at developing skills, boosting motivation, and creating chances to influence employees' pro environmental behavior.

The study looks at how environmental performance of hotels is affected by their use of green human resource management (GHRM). Additionally, it looks at how important pro-environmental psychological capital, psychological climate of the environment, and pro-environmental actions are for improving environmental performance. Green human

resource practices (green empowerment, green performance management and assessment, and green training and development) are important predictors for pro-environmental psychological capital, which further contributes favorably to the psychological green climate. Additionally, it is shown that pro-environmental activities are favorably correlated with the psychological climate of green. Finding shows that workers' pro-environmental activities significantly contribute to improving hotels' environmental performance. It has been shown that by fostering pro-environmental psychological capital, a psychological atmosphere of green, and pro-environmental behaviors, Green Human Resource Management practices indirectly improve environmental performances. This study looks at the almost completely moderating effect of environmental consciousness. For hotels attempting to implement environmentally friendly HR procedures, this report is crucial. When formulating a plan to advance environmental performance by using Green Human Resource practices in various ways, it offered some recommendations to the practitioners. By encouraging green recruitment and selection, green training and development, green performance management and assessment, and green empowerment for the promotion of environmental performance, it also helps the hotel management to increase pro-environmental psychological capital.

While taking into consideration the intervention role of green intellectual capital and environmentally aware behavior, the study looked at the relationship between green Human Resource Management practices and environmental performances in context of Malaysian hospitality. According to the study's findings, there is a connection between green training and development, green disciplinary management, and green intellectual capital, which supports the idea that they are related. The findings show that hotels must provide their staff members the training they need to develop green intellectual capital.

Organizations in the twenty-first century are working hard to lessen their environmental impact since environmental challenges have become a big challenge. The study examines what Green Human Resource Management (GHRM) does for the environment of hotel while taking into account the newest environmental concerns. The study also focuses on how employee green behavior and green self-efficacy interact to have a mediation impact. The results demonstrate that employing green human resource

management approaches improves hotel environmental performance. Additionally, motivated workers are extremely effective once they become involved in engaging green behavior, which improves hotels environmental effectiveness. Using the comparative analysis as a basis, HR in the hotel industry needs emphasis on GHRM procedures in depth. The study provides insightful information on how HR may increase the self-efficacy of the staff members on their involvement in enhancing environmental performance.

3 Theoretical framework

3.1 Research Methodology

The study concentrated on Pakistani workers who manufacture consumer goods such as food, personal care product, and other items for household use. Thus, quantitative data will be used in the research, which will be based on surveys of major companies with 500 or more employees will be selected randomly from Pakistan Stock Exchange. From the 22 listed companies in Stock Exchange, we choose 5 highly traded companies having thousands of employees. Furthermore, after getting permission and support from employees of firm data will be collected. To prevent any biasness, the questionnaire is accompanied by a cover letter. 5-point Likert Scale is used to measure variables.

3.2 Data Collection Methods

The process of data collection is described below.

3.3 Questionnaire

Self-administered questionnaires were used to collect statistical data. In order to get comprehensive data on sizable populations that may be challenging to examine directly, a survey research approach is the most

practical method available. It may be used for descriptive, explanatory, and exploratory goals.

3.3.1 Mode of questionnaire development

Age, gender, service time, and educational level were closed-ended questions that were included in the questionnaire to help identify the study's focus. Likert scales were used for all of the major study variables, with responses ranging from "strongly disagree" to "strongly agree", so that respondents could rate how robust their reviews and experiences were with regard to a variety of interests. Respondents can distinguish between different attitudes. Prior to asking more detailed questions regarding staff experience, managerial capacity, and resilience, the questionnaire is designed to gather generic information first.

3.3.2 Structure of the questionnaire

There are two sections of the questionnaire: The first portion provides data on demographic characteristics, and the second section includes three instruments to measure the variables that have been the subject of the research. The appendix contains detailed description of the questionnaire as well as a copy of it.

3.3.3 Demographic information

In this section of study, the respondents' age, gender, duration of service, and qualifications were sought after.

3.3.4 Instruments

This section solicited feedback on the study interest variables.

- Employee Empowerment.
- Management Commitment.
- Environmental Sustainability.

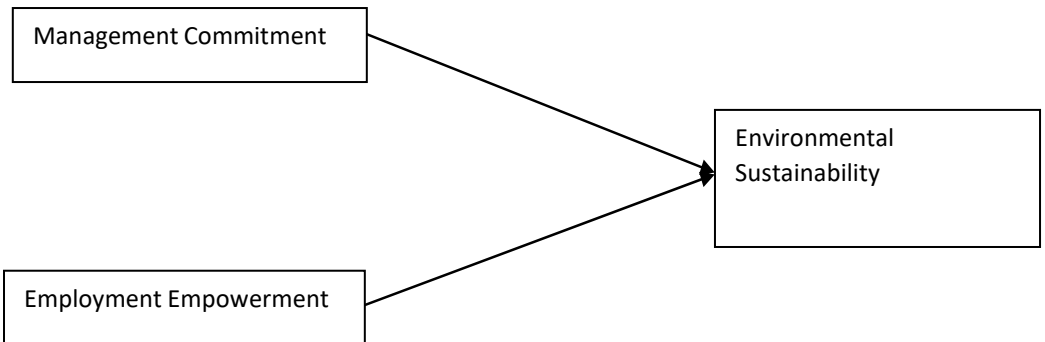
3.3.5 Administration of the Questionnaire

3.3.5.1 Ethics and Confidentiality

The goal of the study and how it will benefit the producing region were briefly explained in an introduction statement. In addition to this, people received guarantees about the privacy of their information to encourage them to give accurate and detailed answers. It was also made clear to them

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that their input was voluntary. Mangers of the stock listed companies who were on duty had been given roughly 100 questionnaires.



4 Analysis Discussion

Table 1: Reliability Statistics Employee Empowerment

	Cronbach Alpha	Rho_A	Composite Reliability	Average Variance Extracted (AVE)
Management Commitment	0.852	0.878	0.887	0.307

Table 1 shows the reliability of the construct, Employee Empowerment”, which is greater than 0.7. It shows the reliability of the data of given variable.

Table 2: Reliability Statistics Organizational Sustainability

	Cronbach Alpha	Rho_A	Composite Reliability	Average Variance Extracted (AVE)
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Management Commitment	0.865	0.832	0.808	0.514
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Table 2, show the test’s reliability, if it is above 0.7, the test is thought to have very good reliability; if it is below 0.5 the test is not thought to have very good reliability. Whether or not an estimate accurately measures what it is intended to measure is discussed in term of validity.

Table 3: Reliability Statistics Management Commitment

	Cronbach Alpha	Rho_A	Composite Reliability	Average Variance Extracted (AVE)
Management Commitment	0.713	0.831	0.892	0.509

Table 3, shows the test’s reliability: if it is above 0.7, the test is thought to have very good reliability; if it is below 0.50, the test is not thought to have very good reliability. Whether or not an estimate accurately measures what it is intended to measure is discussed in term of validity. Because the sample reliability is 0.713, we can say that we have a reliable sample for current research.

Table 4: R square

R Square	Adjusted R Square
0.581	0.572

The relationship between dependent and independent variables are examine by adjusted R square. R square is 0.572 which shows the good relationship between variables, if it is less than 0.5 than is seems to have bad relation.

4 Conclusion

The sustainability of the organization served as the base for this study. In this respect hypotheses were tested.

Ho: Management Commitment as a GHRM practices dose not has significant impact on Organizational Sustainability.

H1: Management Commitment as a GHRM practices has significant impact on Organizational sustainability.

Ho: Employees Empowerment as a GHRM practices dose not has significant impact on Organizational Sustainability.

H2: Employees Empowerment as a GHRM practices has significant impact on Organizational Sustainability.

With the help of a survey questionnaire, various respondents were questioned, and their responses were assessed.

We check the reliability of our data through Cronbach Alpha. The reliability, or internal consistency, of group of scale or test item is evaluated using the Cronbach's Alpha statistics. In other words, "Reliability refers to how consistently a measurement conveys a notion, while "Cronbach's Alpha is a matric for determining how consistently a measurement conveys a concept.

For all of the HRM stakeholders, including businesses, employers, specialists, and academics, Green HRM's prospects are promising. We advise GHRM to overcome ant barriers preventing effective Green Human Resource Management practices and lectures in research and demonstrating environmental management. GHRM has a significant degree for management research but lags behind practically speaking within the academic sector.

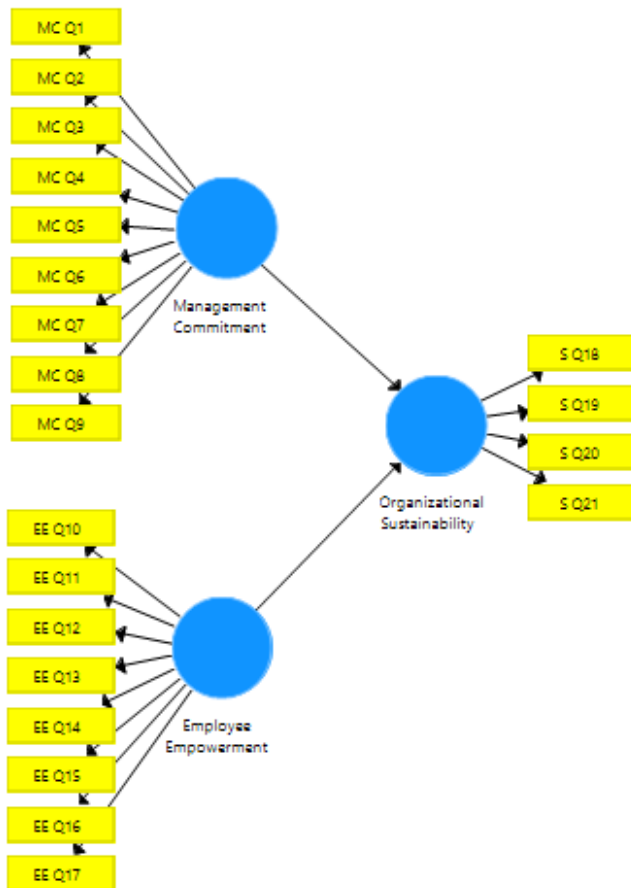
The study's focus was on workers who produced things for domestic use, such as food, personal care items, and other consumer goods, in Pakistan. As a result, the research is based on quantitative data, which was gathered through a survey of significant businesses with 500 or more employees that were chosen at random from the Pakistan Stock Exchange. We will select 5 highly traded companies with thousands of employees among the 22 listed companies on the Pakistan Stock Exchange.

Self-administered questionnaire was used to collect statistical data. The survey research method for gathering substantial data on huge populations that may be challenging to examine directly is survey research technique, which can be utilized for descriptive, explanatory, and exploratory goals.

Additionally, the easiest and most effective way to collect data is through questionnaire. They reduce factual distortions brought on by interviewer biases. The questionnaire is divided into two sections: Three instruments were included in the second section to measure the most investigated factors because the first section contained information about demographic characteristics. Within appendix, there is detailed copy of the questionnaire.

4.2 Methodology of SMART PLS

We used the Partial Least Square (PLS) method and the Smart PLS 3.3.9 programmed to examine the research model. We evaluated the structural model after testing the measurement model (validity and reliability of the measures) in accordance with the advised one-stage analytical processes (testing the hypothesized relationship). Additionally, a bootstrapping procedure (5000 resamples) was utilized to test the significance of the route regression and the



Discussion on bases of results:

To evaluate the hypotheses, reliability assumptions were verifying before the regression analysis. Internal consistency of the measures is referred to as reliability, the goal is to ensure that if these constructs are utilized in other contexts, the result should be consistent. The degree of consistency among the answers across the scale items was discovered using Cronbach's Alpha coefficient approach, which was used to assess the validity of the data. Additionally, the constructs' validity was examined.

A score of greater than 0.7 is typically acceptable so our reliability of all three variables is above 0.7.

Regression analysis were used to test the current research's hypotheses after determining their reliability and validity. The relationship between dependent and independent variables is examined by R square. The R-squarer must be adjusted when a multiple regression is made up of numerous independent variables. Using the adjusted R-Squared, regression models with different numbers of predictors are evaluated for their descriptive power. R square adjusted is 0.572 which shows the good relationship between variables, if it is less than 0.5 than is seems to have bad relation

4.3 Limitations:

- Budget restriction and a lack of time are the reasons limiting the investigation, which could raise concern about reliability of the findings. Additionally, the sample size is restricted to industrial businesses, which could be drawback because it is not generalizable.
- Because this study just offers a general framework and is not narrowly focused on additional categories, future researchers may take into account more aspects of Green Human Resource Management.
- Large sampling sizes are necessary for quantitative research, but due to resource shortages and time restraints, this strategy would not be able to gather as much data as it would be need to.

Recommendations:

First, despite the fact that the nature of study is cross sectional and was done in Pakistan, this assessment of effect analysis may differ between countries and cultural orientations. Longitudinal investigations could therefore be conducted in the future. Second, the current study included demographic characteristics as control variables. It is possible to say that this study simply makes predictions about the relationship between management commitment, employee empowerment, and sustainability in the listed industrial companies on the Pakistan Stock Exchange. Future researchers must be extensive and focus on numerous populations with diverse individuals. In this regard, the quantitative models ought to be produces. Only management commitment and employee empowerment

were examined in this study. It is necessary to perform new research that takes into account additional factors in order to target various impacts on the organizational sustainability.

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Discussion and Analysis of the Monetary Actions of the Three Central Banks to Defend Their Corresponding Economies After the Outbreak of COVID-19

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Abstract: The COVID-19 pandemic jeopardized and risked the United States, China, and Pakistan's central banks' monetary policies, slashing growth, derailing recovery, and pushing the countries' most vulnerable further into poverty and joblessness. And the economic turbulence spurred by the pandemic confronts central banks worldwide with new kinds of monetary challenges, as in Eurozone the situation is more than ever complicated because of heightened volatility emanating from a multitude of monetary policy emergency responses: central banks' intensified bond and securities purchasing programs coupled with negative interest rates. Accordingly, the existence of cyclical trade-off between stabilizing a monetary union, tailing off expansionary monetary policy and maintaining free capital mobility underscores the importance of resolving the trilemma without jeopardizing the currency and financial stability. Furthermore, the 2020 bear market was triggered by coronavirus-induced economic uncertainties, economic fluctuations, and monetary turbulences proliferating across the global financial markets and causing economic meltdowns in most developed countries including the U.S. and China and developing countries like Pakistan as well. And resultantly, the rapid economic uncertainty, and disruptions caused stock markets' plunging into a bear market in early 2020. This needs carefully designed and result-oriented structural reforms in monetary policies by the central banks concerned to ward off the negative effects of inflation and unemployment; triggering growth rates, boosting investment and exports, stimulating stock and financial markets and strengthening economic muscles.

Keywords: Covid-19, Federal Reserve, PBoC, SBP, Monetary, Quantitative Easing, RRR, Trilemma, Bank Lending, Liquidity, Inflation.

1 Monetary responses by the Federal Reserve

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With the eruption of COVID-19, the Federal Reserve experimented with a broad array of monetary actions to minimize the economic loss and announced up to \$2.3 trillion in lending to finance dwindling financial markets, households, financially-stressed employers, and state and local government machineries. Jerome Powell, chair of the Federal Reserve Board of Governors, said in April, 2020, “We are deploying these lending powers to an unprecedented extent [and]... will continue to use these powers forcefully, proactively, and aggressively, until we are confident that we are solidly on the road to recovery”.¹

The Federal Reserve took the following monetary policy measures to support the American economy and financial markets:

1.1 Near-zero interest rates

1.1.1 Federal funds’ rates

In March, 2020, the Federal Reserve took a bold monetary decision by lowering down federal funds’ rates from 1.5% to a range of 0% to 0.25%.² This move was aimed at lowering the cost of borrowing on home equity loans, auto loans, mortgages, reduction in interest income paid to savers, and other loans. Such monetary actions not only affect short-term rates, but longer-term rates as well.

1.1.2 Forward monetary guidance

In September, 2020, the Federal Reserve took new monetary policy framework by putting downward pressure on longer-term rates. In this case, the Fed offered forward guidance on the overnight rates and on the future course of action of its key interest rates, stating that interest rates will remain down “until labor market conditions have reached levels consistent with the Committee’s assessment of maximum employment and inflation has risen to 2% and is on track to moderately exceed 2% for some time”.³

¹ Jeffery Cheng, Tyler Powell, Dave Skidmore, and David Wessel, “*What’s the Fed doing in response to the COVID-19 crisis? What more could it do?*” (2021).

² Ibid.

³ Ibid.

2 Supporting financial markets

2.1 Securities purchases (quantitative easing)

On March 15, 2020, the Fed announced that it would purchase at least \$500 billion in Treasury securities and \$200 billion in government-guaranteed mortgage-backed securities over “the coming months.” This monetary action was taken to increase cash flow for the smooth functioning of financial markets. Then on March 23, 2020, it made the purchases open-ended, with the objective to buy securities and Treasuries bonds “in the amounts needed to support smooth market functioning and effective transmission of monetary policy to broader financial conditions.” Henceforth, market functions improved. Later on, on June 10, 2020, the Fed announced buying at least \$80 billion in Treasuries and \$40 billion in commercial and residential mortgage-backed securities until further orders. In 2020, the Fed accelerated and outright speeded up its ‘securities purchase policy’ from \$3.9 trillion to \$6.6 trillion.⁴

2.2 Lending to financial institutions and firms

Through the revised Primary Dealer Credit Facility (PDCF), the Federal Reserve offered low interest rate (currently 0.25%) loans up to 90 days to 24 large financial institutions. And these institutions provided the Federal Reserve with investment grade debt securities, commercial papers, municipal papers, and equities, as collateral. This monetary tool injected money into the credit markets with the goal to keep them functioning. On March 8, 2021, the Fed stated that this program would last till March 31.

2.3 Scaffolding money market mutual funds

Under the guidance of Federal Reserve, the Money Market Mutual Fund Liquidity Facility (MMLF) was reactivated; which authorized the banks to purchase commercial papers and Treasury securities from prime money market funds, as collateral. The Federal Reserve allocated \$ 10 billion⁵

⁴ Ibid.

⁵ Ibid.

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to increase liquidity against securities, but the MMLF expired on March 31, 2021, because of its limited application. The Fed said that the facility “will assist money market funds in meeting demands for redemptions by households and other investors, enhancing overall market functioning and credit provision to the broader economy.”

2.4 Application of repo operations

Federal Reserve’s repurchase agreement (repo) operations were extensively used to increase the volume of liquidity in money markets. This monetary action essentially offered an unlimited amount of money. Fluctuations in the repo market greatly affected the federal funds’ rate, disturbing price stability and employment ratio. But, Federal Reserve’s facility made cash available to the primary dealers in exchange for government-backed securities and Treasury bonds. The Federal Reserve greatly expanded this facility both in money offered and the maturity period of the loans. As a result of it, the Federal Reserve offered \$1 trillion in daily overnight repo, \$500 billion in one-month repo, and \$500 billion in three-month repo. After March, 2021, the Federal Reserve also increased the amount of per day of overnight repo per borrower, from \$30 billion to \$80 billion.⁶

3 Encouraging banks to financing and lending

3.1 Direct lending to commercial banks

To facilitate the banking sector, the Federal Reserve decreased the rate from its discount window by 2 percentage points, from 2.25% to 0.25%, which it charges the banks for loans from its discount window operations. The Federal Reserve also extended the terms of these loans from overnight to ninety days. The Federal Reserve released money against securities to increase cash flow for banks’ functioning.

3.2 Temporarily relaxing regulatory measures

The Federal Reserve also encouraged both largest and community banks to dip into their regulatory capital and liquidity buffers to stimulate

⁶ Ibid.

lending during the crisis. The Federal Reserve used TLAC (total loss-absorbing capacity), as a monetary tool to increase lending. It also advised big banks to suspend buybacks of their shares. And the Federal Reserve also gave an advisory to the banks to eliminate banks' reserve requirement----though largely irrelevant but, the Federal Reserve considered it necessary tool to accelerating cash flow.

4 Supporting businesses and corporations

4.1 Direct financing to major corporate employers

On March 23, 2020, the Federal Reserve established two new lending facilities: Primary Market Corporate Facility (PMCCF) and Secondary Market Corporate Credit Facility (SMCCF), in a significant monetary decision, to support highly rated corporations, keeping the financial markets moving on. Under these moves, the Federal Reserve purchased existing corporate bonds, and exchange traded funds from the corporations, so that they had cash to pay to suppliers and employees. For this reason, the Federal Reserve stated, “these facilities would allow companies access to credit so that they are better able to maintain business operations and capacity during the period of dislocations related to the pandemic.” Initially Federal Reserve injected \$100 billion to increase liquidity and announced backstop up to \$750 billion of corporate debt. And, the Federal Reserve also received \$75 billion from the U.S. Treasury from its Exchange Stabilization Fund to cover potential financial losses. The Federal Reserve also announced on June 2, 2021, that it would gradually sell off its \$13.7 billion portfolio of corporate bonds.⁷

4.2 Use of Commercial Paper Funding Facility (CPFF)

To inject more money into the money market the Fed purchased commercial paper, through the CPFF, and lent directly to corporations for up to three months, at a rate between 1 to 2 % points. The Federal Reserve validated this action by saying, “An improved commercial paper market will enhance the ability of businesses to maintain employment and investment as the nation deals with the coronavirus outbreak.” Apart from non-bank lending facilities, the Federal Reserve put \$10 billion into the

⁷ Ibid.

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CPFF to cover any losses. The Commercial Paper Funding Facility lapsed on March 31, 2021.⁸

4.3 Giving loans to small and medium sized businesses

Through Main Street Lending Program, Paycheck Protection Program (PPP), New Loans Facility, Expanded Loans Facility, and the Priority Loans Facility the Federal Reserve announced to fund up to \$600 billion in five-year loans. Businesses up to \$5 billion in annual revenue can benefit these corporate credit facilities. The Federal Reserve injected \$75 billion into the three Main Street Programs to cover losses, too. It also increased maximum loan facilities for all eligible borrowers with extension in maturity. In addition, the Paycheck Protection Program Liquidity Facility also facilitated the small business enterprises. The Federal Reserve extended the PPP Liquidity Facility till June 30, 2021.⁹

4.4 Arranging loans for non-profit institutions

Through the Main Street Lending Program, the Federal Reserve provided loans to non-profit institutions, including social service organizations, schools, and hospitals. These loans were offered for five years, but payment of principal was deferred for the first two years. This program, with the rest of the funding facility, lapsed on December 31, 2020.

4.5 Financing households and consumers

On March 23, 2020, the Federal Reserve announced Term Asset-Backed Securities Loan Facility (TALF) to support lending to consumers, households, and small businesses. These loan facilities included auto loans, student loans, and credit card loans. Initially, the Federal Reserve allocated \$100 billion¹⁰ in new credit. Later on, the Treasury allocated \$10 billion from the Exchange Stabilization Fund, too.

5 Supporting state and municipal borrowings

5.1 Direct money lending to state and municipal governments

⁸ Ibid.

⁹ Ibid.

¹⁰ Ibid.

Under the Municipal Liquidity Facility, the Federal Reserve allocated \$500 billion to loan to the government entities that had investment-grade credit ratings as of April 8, 2020 in exchange for notes tied to future tax collections with maturities of less than three years. Later on, the Federal Reserve with the approval of the U.S. Treasury provided additional \$35 billion to cover any potential losses.¹¹

5.2 Supporting municipal bond liquidity

The Federal Reserve through its credit facilities such as, Money Market Mutual Fund Liquidity Facility (MMLF), and Commercial Paper Funding Facility (CPFF), funneled cash into the municipal debt market backed by tax-exempt state and municipal securities, where liquidity was under stress, with maturities up to 12 months.

6 Protecting US money markets from international pressures

6.1 International swap lines

The Federal Reserve is exchanging U.S. dollars with other central bank's currencies, so they can lend to commercial banks. In exchange the Federal Reserve gets foreign currencies charging interest on the swaps. In this case, five foreign central banks have permanent swap lines with the Federal Reserve. The Federal Reserve has, too, lowered the rate it charges on those swaps with central banks in the Eurozone, England, Canada, Switzerland, and Japan, and extended the maturity as well. It has extended temporary swaps to the central banks of New Zealand, Sweden, Brazil, Korea, Singapore, Denmark, Mexico, Australia, And Norway. These temporary swaps ended on September 30, 2021. The Federal Reserve also through a new repo facility called Foreign and International Monetary Authorities (FIMA) is offering dollars to central banks which do not have an established swap line with it. This monetary action also included overnight dollar loans to the central banks against collateral.

7 Critique on federal reserve's monetary actions

When the financial markets are strangulated, business enterprises, and firms tend to draw on bank lines of credit facilities, and that can lead banks to sell securities and unlimited amount of Treasury bonds or pull

¹¹ Ibid.

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back on other loans. The Federal Reserve has been supplying ‘unlimited liquidity’ (unlimited QE) to the banks, to confronting the “severe coronavirus disruptions” so they can meet credit constipation relieving balance sheet strains. With the credit injections, the Federal Reserve has been trying to keep the capital markets functioning as smoothly as possible. The statement of Don Kohn, former Federal Reserve Vice Chair, validates Federal Reserve’s monetary actions, in these words, “The Treasury market in particular is the foundation for trading in many other securities’ markets in the U.S. and around the world; if it is disrupted, the functioning of every market will be impaired. The Federal Reserve’s purchase of securities is explicitly aimed at improving the functioning of the Treasury and MBS (Mortgage-backed Security) markets, where market liquidity had been well below par in recent days.”¹²

8 Recommendations

Here are some more monetary measures the Federal Reserve could take into action:

- It could lower interest rates below zero, as several other central banks have moved to negative rates but, the Federal Reserve said it probably would not do so.
- The central bank had room to expand its lending facilities. As of March 31, 2021, the Money Market Mutual Fund Liquidity Facility, the Commercial Paper Funding Facility, and the Primary Dealer Credit Facility will lapse. Only the PPP Liquidity Facility was extended through June 30, 2021.
- The Federal Reserve could restart the ‘Term Auction Facility’, as an alternative to the discount window. This could boot banks confidence flushing out their fear to be labelled as ‘financial weak’. Under the TAF, the Fed auctioned 28-day and, later 84 day loans to U.S. and foreign banks. The TAF is considered a better monetary tool than that of open market operations. Because TAF helps promote the distribution of liquidity when unsecured bank funding markets face financial constraints. During the crisis the TAF borrowing peaked at \$450 billion.

¹² Ibid.

- The Federal Reserve should designate more financial firms as primary dealers to borrow from the Primary Dealer Credit Facility. But it designated only two dozen firms as primary dealers. In addition, hedge funds and other institutions can be included in this category. This facility can also be extended through December, 2021.
- Strengthening its forward guidance coupled with extraordinary measures for maintaining massive securities purchases, and near-zero interest rates, unless sound economic conditions are achieved, can yield better results.
- The Federal Reserve should launch another policy tool, too, --- ‘Yield Curve Control’ to cap somewhat longer-maturity yields ranging from two to three years, at low levels, by deciding to purchase whatever amounts of Treasury bonds and securities are necessary to cap the rate. During the pandemic-hit crisis other central banks deployed this policy.

9 Monetary responses by the People’s Bank of China

With the COVID-19 proliferation, to avoid economic upheavals, the PBoC deployed a package of monetary actions to support the financial markets and banks. The People’s Bank of China (PBoC) eased the credit market by using ‘restrained monetary’ policy instruments, including loan facilities, the reserve requirement ratios, open market operations, rediscount policies, and refinancing. In addition, the central bank implemented a series of financial support measures, especially for small and medium-sized enterprises (SMEs), including increasing debt rollovers, renewal of loans, provision of specific credit lines for the resumption of production, and reduction in interest rates. The central bank also supported and encouraged ‘Ant Financial’ and other online financial companies to ease financing for small and micro businesses.

10 Monetary responses: credit easing, loan rate reductions and debt rollovers

The PBoC encouraged and supported the financial institutions to cut loan interest rates, providing additional credits to antivirus-related materials manufacturing firms, daily necessity retails and delivery sectors, and

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producers of medical gadgets, too. The central bank asked the commercial banks to roll over debt contingencies for SMEs, improve quality of services, including expanding the circle of e-payments and online banking services, and launching a ‘green channel’ for coronavirus-related business activities. The central bank offered additional credit to the trading industry for the arrangement and importation of medical materials from abroad. The China Banking Regulatory Commission (CBRC) advised the commercial banks to adjust personal loan repayment mechanisms for credit cards, delayed repayment periods, and hosing mortgages. By March, 2020, the banking sector had injected RMB 1.4 trillion into the economy. The central bank encouraged internet-based financial companies to ease loans access for small and micro businesses. The central bank cut its targeted reserve requirement ratio by 0.5 to 1 percentage points and released RMB 550 billion for long-term funds.

11 Monetary policy measures taken by the PBoC

Amidst the considerable pandemic-induced economic shock, the PBoC used a number of monetary policy tools to minimize the economic repercussions of the crisis.

11.1 Reserve Repo Rate Operations (RRR)

The PBoC, deployed reserve repo operations’ tool to increase sufficient cash flow in the financial markets. Through reserve repo operations the central bank injected, in the first place, RMB 1.2 trillion in liquidity into the banking sector by lowering repo rates by 10 basis points, and again injected RMB 500 billion into the banking sector, then further injected RMB 900 billion into the banking sector, again RMB 100 billion were injected into the banking sector, followed by provision of RMB 50 billion in liquidity into the banking sector with a cutting of repo rates by 20 basis points. To further boost liquidity into the financial markets, the central bank injected RMB 20 billion, RMB 670 billion, RMB 1.54 trillion, and RMB 130 billion through RRR coupled with RMB 900 billion through MLF operations, and again RMB 100 billion with 20 basis points cut through MLF operations, into the banking sector. The central bank also announced plans to support bond issuance by financial institutions to increase cash flow. In addition, it decreased one-year loan prime rate by

20 basis points and five-year loan prime rate by 10 basis points, too. PBoC also lowered relending and discount rates by 25 basis points. Furthermore, the central bank earmarked RMB 900 billion especially for the small and medium-sized enterprises (SMEs) through ‘relending’, ‘low-cost funds’, and ‘rediscount quota’ with lower rates by 25 basis points to 2.5%, and RMB 550 billion in long-term funds through required reserve ratio (RRR), with cuts of 50-100 basis for loans. Further, RMB 300 billion in special central bank lending were allocated by the central bank to provide low-cost funds for banking lending, supporting coronavirus prevention and control programs, with financial costs below 1.6%. To increase cash flow into the economy the State Council also increased central bank’s rediscount quota and relending by RMB 1 trillion to finance SMEs, ordered PBoC to cut RRR for small and medium-sized banks, and reinforced the central bank’s support for bond financing, too. In addition, the State Council guided the central bank and financial institutions to issue extra-low-interest loans worth RMB 300 billion to support self-employed businesses, and ordered policy banks to earmark RMB 350 billion special credit quota for loans to small and medium-sized enterprises (SMEs) at preferential rates. To further fuel liquidity into the markets the central bank announced decrease in RRR for small and medium banks by 5 basis points and released RMB 400 billion, and also announced cut from 0.72% to 0.35% in the excess deposit reserve interest rate of financial institutions, deposited in the central bank.¹³

It is analyzed that China’s post-COVID-19 monetary policy is expansionary. However, the central bank this time used a different policy mix, as this time liquidity injections and earmarked policy responses play a major financial role leading to lower interest rate level. For example, in the first half-year 2020, the 1 year lending prime rate was reduced by 30 basis points from 4.15% to 3.85%. And this was done with reduction in reverse repo rate (RRR). As of it, since February 2020, the overall RRR cut in March released long-term funding of about RMB 550 billion, followed by two more target RRR reductions by 0.5% points for small and medium banks released about RMB 400 billion cash flow. Furthermore,

¹³ Yi Huang, Chen Lin, Pengfei Wang, and Zhiwei Xu, “*Saving China from the coronavirus and economic meltdown: Experience and lessons.*” (2020)

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with regard to open market functions (repos and reverse repos), the gross liquidity injections reached RMB 5080 billion during February-June 2020. And, in the first half-year 2020 liquidity worth RMB 2007 was injected into through relending, Municipal Liquidity Facility (MLF), and rediscounting injections. The net liquidity injections through various loan facilities and RRR reductions were RMB 9.4 trillion between April 2018 to January 2020. In contrast, during February-June 2020, the central bank injected only RMB 29 billion into the banking sector. In other words, the central bank adopted “restrained monetary measures”, in consistent with its ongoing steps towards financial stability.

Since the beginning of 2020, the central bank deployed sequential step-by-step approach. In other words, this incremental monetary approach shows that after the short recession; the central bank wants a V-shaped recovery with a return to normal in the second half of 2020 followed by growth acceleration in 2021. Due to restrained monetary policy measures followed by seasonally adjusted month-on-month growth rates of retail sales, fixed asset investment, and industrial production have also recorded rebounds of 0.9%, 6.2% and 29.6% respectively.¹⁴ In this way, the central bank considers that traditional policy slashing interest rates with provision of liquidity not a good solution to virus-hit markets and thus ill-advised. In short, more targeted monetary interventions show more promising results during such “typical recessions” caused by coronavirus crisis like situations. For example, the central bank deployed an earmarked and calculated measures for loans to SMEs. From this angle, the central bank’s many monetary measures target specific industries, avoiding ‘loose monetary policy, appears remarkably relaxed and restrained, in contrast with many other countries’ central banks’ exceptional array of pandemic-controlling monetary instrument.

12 Critical analysis of PBoC’s monetary actions

In the first place, the current economic outcomes seem to be the result of central bank’s unorthodox and earmarked mix of monetary policy tools. Secondly, the central bank adopted a stepwise and incremental monetary approach to tackle the recession-like situation. Thirdly, the prevailing

¹⁴ Ibid.

economic indicators show the PBoC has executed a remarkable variety of policy steps following the coronavirus-induced disruptions. Fourthly, it is also revealed that the central bank acted upon novel policy responses to ensure that commercial banks maintain cash access and credit provision during the uncertain situation. Fifthly, the current monetary loosening though swift but decisive, is in contrast with the radical and unique monetary measures adopted by other countries' central banks. In brief, the Chinese central bank keeps a vigilant eye on containing the country's debt pile. This may be based on PBoC's assessment that the recovery from the crisis-like situation is "so far, so V-shaped." The coming financial years will indicate the robustness of this restrained monetary judgement and establish that the "swift but decisive policy interventions" were adequately well-deployed to meet these profound economic uncertainties, and exceptional challenges.

13 Monetary responses by the State Bank of Pakistan

The State Bank of Pakistan implemented several monetary measures to minimize the impact of Covid-19 on the economy. In March, 2020, the Monetary Policy Committee (PMC) cut the policy rate by a cumulative 225 basis points. In addition to it, the SBP cut interest rates for its borrowers by 225 basis points, easing pressures from the businesses facing cash flow problems, because the Covid-19 pandemic made the situation uncertain and severely impacted tax collections. SBP also launched a concessional rupee financing scheme (EFS) to inject further cash into the financial markets.

Following are the monetary measures announced by the SBP to mitigate the impact of Covid-19 on economy.

13.1 Refinance Facility for Combating Covid-19 (RFCC)

The SBP earmarked Rs5 billion for the hospitals and medical centers to purchase medical gadgets. Furthermore, the SBP allowed all federal and provincial governments' departments, charitable organizations, manufacturers and commercial importers, and public and private hospitals to make 'Advance Payment Import and Import on Open Account', without any limit, for the import of medical tools and medicines.

13.2 Increasing credit flows to borrowers and easing loan repayment program

Reducing the Capital Conservation Buffer from its existing level of 2.5 % to 1.5% effectively increased the loanable funds available with banks by Rs 800 billion. Furthermore, the central bank allocated about Rs 2.3 billion for individuals to borrow more from commercial banks with relaxation in debt burden ratio requirement for consumer loans from 50% to 60%. The commercial banks were instructed to defer the payment of principal on loans and advances by one year. This response eased financing constrains to facilitating the borrowers. The SBP also relaxed the regulatory criteria for rescheduling of loans within 180 days. In addition, the timeline for classification of “trade bills” was extended from 180 days to 365 days.¹⁵

13.3 Extension in export performance period for EFS & LTFF

Exporters availing the subsidized credit schemes under Export Finance Scheme (EFS) have been facilitated with extension in shipping goods from 6 months to one year. Exporters who export goods worth US\$ 4 million were facilitated with additional credits and loans under the Long Term Financing Facility (LTFF) during the period January, 2020 to September, 2020. Moreover, the requirement of annual projected exports performance for four years to benefit LTFF, was extended by one year.

13.4 Extension in realization of export proceeds and import of goods under advance payment

The SBP instructed the commercial banks to facilitate the exporters by increasing the time period for realization of exports’ proceeds from existing 180 days to 270 days on a case to case basis. Likewise, to encourage the importers the central bank extended the time period for imports of goods into Pakistan against advance payments from existing 120 days to 210 days. Additionally, the exporters were allowed to directly send the shipping documents of their exports’ consignment to foreign

¹⁵ The State Bank of Pakistan’s “*Economy Second Quarterly Report*” for FY20.

buyers without any limit. And for importers the existing limit of US% 10,000 per invoice for advance payment was increased to US\$ 25000.¹⁶

13.5 Electronic submission of foreign exchange-related cases to SBP

To encourage import and export activities, the SBP launched the ‘Regulatory Approval System’ (RAS) for commercial banks and financial institutions to electronically submit foreign exchange operations and policy-related cases to the Exchange Policy Department (EPD), and Foreign Exchange Operations Department (FEOD).

13.6 Credit to Small and Medium-sized Enterprises (SMEs)

The central bank enhanced the existing regulatory retail limit of Rs 125 million to Rs 180 million to facilitate the small and medium-sized enterprises (SMEs). And encouraged commercial banks to provide additional loans and lending to the businesses and SMEs. Commercial banks were also instructed to reduce the margin call requirement of 30% to 10% vis-à-vis banks’ financing.¹⁷

13.7 Boosting investment in manufacturing via Temporary Economic Refinance Facility (TERF)

To enhance investment in the country, the central bank earmarked Rs 100 billion to provide financing at 7% rate for 10 years for the establishment of new industrial units.

13.8 No charges on IBFT/ATM withdrawals

The SBP instructed the commercial banks to waive all charges on fund transfer through online banking transactions such as SBP’s Real Time Gross Settlement System, ATMs, and Inter Bank Fund Transfer (IBFT). In addition, amid the crisis, several general customer facilitation measures were also taken to increase the volume of financial transactions. Better financial services were provided to the customers, investors, importers, and exporters injecting more liquidity into the economy, too.

¹⁶ Ibid.

¹⁷ Ibid.

14 Critical analysis of SBPs monetary responses

Due to the expansionary monetary policy of SBP, inflationary pressures reached 11.1 percent during the first half of FY20. This inflationary trend was attributed to a number of factors such as coronavirus induced liquidity injections, supply disruptions, growth contractions, and demand compression. On the other hand, a notable improvement in the country's balance of payment situation led to appreciation in Pakistani rupee, is attributed to stability in the short-term inflation outlook. The ease in liquidity was attributed to central bank's higher financing mobilization policies from external and non-bank sources, and spending its cash buffers during FY20. In addition, credit demand from the private sector contracted as industrial activities remained largely subdued. Meanwhile, some vibrancy was observed in export oriented sectors, but their earnings registered a marginal increase in liquidity. Currently, there is galloping inflation due to post-COVID-19 expansionary monetary policy of its central bank. At least double digit industrial and agricultural growth rate is needed to control increasing inflation and unemployment coupled with growth-led structural readjustments and investment and business-friendly policies by the State Bank of Pakistan.

15 Monetary policy spillovers' effects and trilemma

Monetary measures of financial center countries have larger spillover effects on smaller economies. In this way, nature of links with the center economies is the major factor affecting financial conditions in emerging and developing countries. An economy that chases greater exchange rate stability and financial openness has a stronger link with the center economies.

The integrated nature of the financial system has been severely disrupted by the turmoil in emerging market bond markets and currency markets in the wake of Covid-19; leading to an unconventional monetary policy implementation by the Federal Reserve. In this way, policymakers in emerging market economies perceive an increasing economic vulnerability to the whims of the global financial system. Countries following a variety of exchange regimes all witnessed challenges in insulating their economies in the most recent turbulent episode. This has

led to grand economic ramifications about the continued relevance of the ‘monetary trilemma’.

Occurrence of hypothesis of the monetary trilemma, in the open economy management system, has been viewed as a trade-off between the choices of financial openness, exchange rate stability, and monetary autonomy. This hypothesis and its extension in recent turbulent time suggest a continuous trade-off between the three trilemma dimensions, leading to the possible emergence of a fourth policy goal---quadrilemma where international reserves may play a role as buffers.

Likewise, the COVID-19 bear market has considerably impacted the policy trilemma of the countries concerned, with serious economic implications as falling stocks prices. During these financially dwindling scenarios, investor confidence goes down, and investing can be risky.

There are many push factors of a bear market, such as global COVID-19 pandemic, investor fear or uncertainty, irresponsible lending, and disruptions in supply-demand equation, and more.

16 Conclusion

In the aftermath of Covid-19, it is concluded that the economic centers’ monetary policies influence other countries’ national monetary policies, too. And this happens mostly through credit growth, bank leverages, and capital flows, making the types of exchange rate regimes of non-centers irrelevant. In other words, the countries in the periphery are all sensitive to ‘pandemic-induced disruptions’ irrespective of their exchange rate regimes. In this scenario, the ‘trilemma’ reduces to an ‘irreconcilable duo’ of an independent monetary policy and free capital mobility. Consequently, the recent experience of coronavirus-driven monetary measures of many countries may present the ‘irreconcilable duo’ worth considering. Since the outbreak of COVID-19, the Federal Reserve has been trying to inject credit into the banks and financial markets to increase spending so that financial system does not amplify shock to the economy. It also has been taking monetary actions to do what it can to mitigate the permanent damage to the national economy so that when the pandemic goes back, the economy can flourish and grow again supplying goods and services to the demand market. The Central Bank of China also announced that it would implement a “restrained monetary policy

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package”, including easing central bank lending facility, open market operations, central bank discount policy, and standing lending facility to inject sufficient liquidity into the financial markets. The State Bank of Pakistan, too, announced multiple monetary responses to facilitate the general public’s access to financial services, simplified procedural laws for importers and exporters, and allowed banks leeway in booking losses related to the pandemic on their financial statements. The two developed countries, China-U.S. and Pakistan, developing one, were economically moving on well when the pandemic began. Now, the central banks are making required structural reforms in the banking system to rein back inflationary trends, and we may hope for a V-shaped recovery after the uncertain period ends.

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Impact of Tax Pilferage on Political Economy: A Case of Pakistan

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Pakistan is a developing country whose main source of revenue is taxes. However, tax non-compliance is on the rise and tax gap of the country stands at around 50%. This leaves the government with meagre resources to fund its responsibilities. This has repercussions for the political economy. The government is not able to provide basic necessities of health and education to its citizens. Similarly, many loss-making PSEs need government support to function, however, due to low revenue collection, the government is unable to fund them. Another issue associated with tax non-compliance is that the evaded money remains into the hands of individuals that causes inflation due to increased circulation of money. Moreover, in order to provide public services and fund its PSEs, the government resorts to borrowing from internal or external sources and have to go through the painful process of repayments that is the foremost responsibility in government expenditures. The study recommends that in order to get rid of the vicious circle, privatization of certain PSEs, control of corrupt practices including tax evasion and effective utilization of loans may be used as tools to mitigate the harmful effects of tax evasion on political economy of Pakistan.

Key Words: Tax Efficiency, Political Economy, Debt.

1. Introduction

“*Taxes are the Sinews of the State*”. This quote was stated by a Roman Statesman, orator, Philosopher and lawyer, Marcus Tullius Cicero who remained part of the Roman Council in the year 63 BC. Cicero was of the view that taxes played crucial role in the Roman Empire and that the state could not flex its muscles till the time they abstract revenue from the private sector (Winer, Profeta and Hettich 2013). Although Cicero referred to taxing the private sector as an instrument of taxation, modern literature suggests other instruments which include a variety of direct and indirect taxes. According to Winer et, al. taxation is mostly an economic issue as it enables the government to collect resources, however, choice of instrument of taxation is a political issue and that is why taxation has both political as well as economic implication.

Like other developing nations of the world, Pakistan has been facing the dilemma of poor tax collection as the tax collection mechanism in the country is not efficient. As depicted by the budget estimates, Pakistani authorities rely more on indirect taxes in order to resolve the issue of

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narrow tax base of the country. According to the Active Taxpayers List (ATL) issued by Federal Board of Revenue (FBR) of the country, Pakistan has around 2.88 million registered taxpayers as in FY 2021¹. It is pertinent to mention that this number is very less for a country with an estimated population of more than 220 million. The main reasons for this small number is mostly economic, behavioral, institutional and social aspects factors that affect compliance behavior (Hassan, Naeem and Gulzar 2021). This poor tax collection ultimately affects the institutional and administrative capacity of the country and ultimately the political economy suffers as a result.

In order to effectively monitor the impact of tax evasion on political economy, there is a need to first define Political Economy in concrete words. Political Economy has been another name for Economics. As evident from the literature the term Economics was previously used by Economists like Adam Smith, John Stewart Mill and Sameulson among others. According to Paul Adler, *“Political economy refers to the combined and interacting effects of economic and political structures or processes, and by extension, to the scholarly study of this domain”* (Adler 2009). According to Adler, as the market mechanism strengthened in the 19th century in the capitalist world, the role of government reduced to public economics (taxes and expenditures policies) for the purpose of social welfare. Not much has been done to measure the impact of evasion on political economy, therefore, the study has made an attempt to measure the affects of poor tax collection on different indicators of political economy.

In order to carry on with the study, a review of literature has been carried out in the first section followed by a brief discussion regarding the methodology in the second section. The third section includes discussion that contains a broad explanation of political economy and its indicators followed by impacts of tax pilferage on different indicators of political economy with special reference to Pakistan. The fifth section concluded the study along-with certain policy implications.

2 Literature Review

¹ FBR website : <https://www.fbr.gov.pk/categ/active-taxpayer-list-income-tax/51147/30859/%2071169>

Tax evasion that constitutes a large portion of underground economy is a significant phenomenon present in all economies whether developed or developing (Gupta 2005). This presence of underground economy has recessive effects on the economy that also creates unstable business cycle (Bajada 2003) (Dzhumashev and Gahramanov 2010) conducted a study in the Australian tax system and found that tax evasion hampers economic activity. The study concluded that the government needed to keep tax rates, detection probabilities and penalties such that it is able to collect taxes in order to incur expenditures that are required for economic development.

3 Impacts of Tax Evasion

Tax evasion possesses ethical issues and causes distortions in welfare expenditures while hampering economic growth of a country (Giles and Caragata 2001) Discussion regarding the effects of tax structure and compliance on economic growth is a well-documented part of the tax literature. According to (Roubini and Sala-i-Martin 1995) countries with inefficient tax systems have a tendency to suppress the financial sector and create inflation by creating more money to meet the demands of the government as the main source of revenue are not available due to tax evasion. (Chen 2003), is of the view that there is an ambiguous relation between tax evasion and economic growth but –according to Chen – economic growth is effected negatively by tax evasion. (Cobham 2005) is of the opinion that a large amount of revenue is lost by governments in developing nations through tax pilferage. According to estimates of the study, a total of US\$ 385 billion had been lost annually due to non-payment of taxes in developing nations. The study blamed prevalence of high level of shadow economy and claimed that shadow economy gives rise to poor tax collection that ultimately reduces revenue available to the government.

There are studies on the contrary that think otherwise. According to (Lin and Yang 2001), higher tax rates educe propensity to pay that increases tax evasion and in turn economic growth also increases. The reason is

attributable to the fact that evasion transfers resources from nonproductive public sector to the productive private sector. Similarly studies suggest that sometimes tax evasion increases growth rate to a certain extent as more money remains into the hands of entrepreneurs who in turn invest the saved money that ultimately contribute to betterment in the economy (Cerqueti and Coppier 2011). Similarly, (Gale, Krupkin and Rueben 2015) was of the opinion that effective enforcement for tax compliance led to more money in to the hands of the government that used it to provide better productive inputs to the private sector that can be used to enhance profits and hence savings and investment. The research included a comparative study of different states of USA and concluded that having a lower tax rate increased chances of more compliance that ultimately lead to economic growth. Moreover, a study carried out by (Kalaš, Mirović and Milenković 2018) in Croatia and Serbia took GDP as an indicator of growth and found a significantly positive relationship between tax revenue collection and GDP growth.

4 Tax Pilferage and Service Delivery

Public service delivery has also been a subject of importance viz-a-viz tax evasion as seen by the literature. (Myles 2000) has revealed that government provided public goods by raising revenue through taxation. However, it was necessary for the government to collect tax and raise tax rates if necessary to provide public services to its citizens. These increased tax rates led some people with lower income to rethink their tax paying behavior and indulge in tax evasion. Resultantly – according to Miles, tax non-compliance hampered provisioning of public services. The same results have been presented by (Kar and Banerjee 2018) who claim that in developing nations, income tax collection was at its lowest that had impacts on provisioning of public service delivery due to shortage of revenues with the government. Literature has therefore suggested that government proves out to be inefficient in providing public services as compared to the private sector. (Myles, 2000) placed doubts on the provision of public services by the government and suggested that the government should act as facilitator for the private provision of public goods especially in countries where tax evasion is higher or where the governments were inefficient in the use of public services. The same argument had been taken further by (Beach and Jones 2017) who claimed

that government provided public goods were more problematic and politically less feasible in areas with high economic inequality and diversity.

Role of monitoring level in increasing economic growth can also be affected by tax evasion. Monitoring level is an important instrument used in literature for economic growth. This is because as monitoring levels will increase, all dishonest individuals who evade taxes will have a greater probably of being caught (Cerqueti & Coppier, 2011). This higher probability of being caught would increase tax revenues and in turn an increases the economic growth of a nation. If any individual is caught evading he or she has to be penalized. Penalties play an important role in this regards as shown by literature. Provision of public goods will be the result of revenue collected that is again a function of taxes collected plus fines imposed on evasion (Blackburn, Bose and Haque 2006). Care needs to be taken on imposing penalties. Research has shown that if penalties are imposed proportionately to the amount evaded, there will be a reduction in private capital accumulation and increased economic growth, however, if penalties are imposed at flat rates then increased tax rate would encourage more evasion and the result will be negative for revenue collection (Caball'e and Panad'es 2007).

Causal relationship between evasion and inflation rate has also been an integral part of the existing literature according to (Crane and Nourzad 1986) who studied the relationship between the two variables in USA found a highly significant and positive relationship between evasion and inflation rate. (Fishlow and Friedman 1994) studied three economies for a period of 1960 – 1990 and concluded that tax evasion in developing economies lead to more inflationary taxes in the economy that reduces economic growth and increases inflation. Similarly (Hung 2017) discussed an indirect relationship between tax evasion and inflation. In their opinion, tax evasion is negatively related to economic growth that further leads to inflation in an economy. Public debt is another main cause of tax evasion as shown in literature. Public debt itself is detrimental to the economic wellbeing of a country as it becomes a source of future tax burden in the society (Greiner and Fincke 2009). As tax evasion rises, it gives rise for the government to maintain its expenditures through more borrowing and hence public debt increases (M.Ivanyna, Mourmouras and Rangazas 2016). However, (Halkos and Papageorgiou 2020) is of the

view that if the government is farsighted and decides to take action against corrupt practices like tax evasion, the government acts against evaders and this action leads to more tax accumulation and hence public debt reduces in the longer run. (Petrohilos-Andrianos and Xepapadeas 2017) has concluded that lower tax collection leads the government to borrow money to finance its expenditures that have otherwise been collected through tax collection.

5 Research Methodology

This article includes descriptive study where relationship between tax evasion and political economy has been explored. The research is non-empirical based on secondary data in which literature is used to determine the effect of tax evasion on different indicators of political economy while newspapers and scholarly articles have been studied. Moreover, government documents including Ministry of Finance Pakistan (budget) document and Economic Survey of Pakistan have also been analyzed to gather data on the subject with the aim to estimate the level of presence of indicators in case of Pakistan.

6 Results and Discussion

6.1 Political Economy

Political Economy is a conglomeration of two Greek words “*Polis*” (a state of a city).and “*Oikonomos*” (manager of a household). In this context the word Political Economy is thus the study of how a country (household at public level) is governed or managed, keeping in view both the economic and political factors.² The term political economics was pioneered by Adam Smith in his famous book *The Wealth of Nations* in the year 1776 he termed the concept of economics as political economics. According to (Groenewegen 1987) the term actually originated in France by Montchrétien (1575 - 1621) in the seventeenth century while Sir James Steurt in 1761 was the first English economist who used the term in his book titled ‘*An Inquiry in to the Principles of Political Economics*’. Political Economics is basically a study that involves rational decision

² Britanica Online : <https://www.britannica.com/topic/political-economy>

making keeping in mind the political and economic factors (Alt and Shepsle 1990).

As obvious from the definition of Alt & Shaple, political economy is a combination of two terms, politics and economics, therefore there is a need to first define and explain both terms before proceeding further. Politics is termed in the political science literature as study of authority and power. According to Uphoff & Ilchman politics is the exercise of authority over a group of people which may be in the form of control over economic resources, legitimacy, information, status and power to exert force to form an organized group (Uphoff and Ilchman 1997). People in authority need these resources in desired amount in order to sustain the operations of the polity (intra-state activities) and to sustain their authority which they get either from the public or generate from the state directly (Uphoff N 1989). The authority can also be shared to some extent with the members of public or by making decisions desired by them as a result of demands created so that there is a political exchange to keep the process running (Emerson 1976). As a result of the decisions made by person in authority and which are in the benefit of the public, the public provides resources that enable the government and the regime to run and function properly (Miliban 1968).

Authority gives a particular person power to influence his decisions as authority establishes certain roles and relationships that allow a person to enforce power either through economic incentives or physical or moral force over other people (Uphoff & Ilchman, 1997). The roles thus established as a result of attainment of authority are either through consent of the parties or coerced and they establish what Easton calls political division of labor where one party is authorized to exert authority and the others (the public) is bound to abide by those roles (Oppenheum 1978). However authority ceases to exist at the very instance when a person is no longer qualified or cannot have claim over the resources or to enforce decisions.

Authority is valid till the time authority with a specific person is recognized by others or he or she fulfils certain qualifications as laid down in the polity (Uphoff, 1989, p. 312). Power and Authority are two different things. Power is the ability of an individual or a group of people to achieve their desires objectives (Henderson 2012) whereas authority is the direct or tacit approval of a group of people by permitting an

individual to take decisions for them in a specifically defined area (Lindblom 1977). Lindblom has described politics as a struggle for authority where people are making efforts to gain authority over the others. He termed politics as an *'untidy process'* where some people are in an effort to gain authority over others in a society while there are others who try to gain control of those who hold authority. Politics can be considered as a study of finding mechanism to make collective choices whereas authority can be thought of a particular type of mechanism that can be used to make collective decisions (Keohane 1984).

If power of a person cannot be exercised in relation to another person as a result of his wealth or any other resource he obtains but cannot claim authority, then the first person has no authority and in this case the first person will have to exercise any power other than authority to keep the affairs running (N. Uphoff 1989). Power is a term in politics that was first described by Max Weber as a social relationship where one actor is in a position to exercise his will despite resistance within that social setup (Weber, 1947). However, later literature did not produce a substantial distinction between power and authority. Authors have used power and authority interchangeably and no distinction has been made so far. Concluding the two elements of politics, politics is the exercise of power and authority to fulfil certain objectives by people in command over those subject to their authority. Politics in short is the division of political labor where one group is given power and authority over another group to run the system of a society.

Economics on the other hand is the efficient utilization of scarce resources to fulfil unlimited wants. Adam Smith who is considered as the father of economics defined Economics as *'Science of Wealth'* in his famous book *"An Inquiry into the Nature and Causes of Wealth of Nations"* which was published in 1776. Jean - Baptiste Say also defined Economics as a science that dealt with wealth (Say 1803). Previously, economics was not a separate subject rather it was studied in conjuncture with other concepts like philosophy or politics. Political Economics at that time meant the study of conditions where production was organized in states of the capitalist system (Khumalo, 2012).

Alfred Marshall in the year 1890 criticized the definition of economics as proposed by Adam Smith by saying that the definition was too narrow and was focused on creation of wealth hence teaching selfishness. Marshall

came up with his own definition of economics. According to Marshall, Economics studied both the individual and social actions that were aimed at promoting well being of the individuals (Marshall 1890). According to (Robbins 1932), ‘*Economics is the science which studies human behavior as a relationship between ends and scarce means that have alternative uses.*’ (p. 15). According to Robbins, the end were wants that were unending and unlimited whereas means were the resources that are always limited. According to him, Economics is the satisfaction of unlimited wants with limited available resources.

If we look at derivation of the word from Greek language meaning *oikonomos* which means management, the definition clearly means that economics means management of scarce resources and unlimited wants. Similarly Robbins also talked about making choices. As resources are limited, therefore – according to Robbins – people make choices and choose the option that best fulfils their wants. Paul Anthony Sameulson came up with another definition in his book ‘*Economics – An Introductory Analysis*’ in the year 1948. Sameulson took the features of previous definitions as it took in to consideration the scarcity of resources and their management while he also took in to account the best use of those resources so that those scarce resources could be used for present as well as for future consumption. Sameulson’s definition focused not only on production but also on consumption and was both growth and future oriented in nature (Sameulson 1948).

According to Khumalo, Sameulson’s definition included utilizing scarce resource of the society to produce valuable output and distribute them among different people. The separation between economics and politics occurred and economics became a specialized subject competing other sciences and included mathematics as mathematics was thought to be the basis of any science (Heilbroner 1980) Later on in 1995, Lypsey and Chrystal came up with a concept of modern economics and defined Economics as an allocation of resources among different alternatives and distribution among different individuals (Lipsey and Chrystal 1995). Lipsey basically talked about the way allocation and distribution of a society’s resources change over time that can change due to change in the mode of production or can be a result of changes in social system (Khumalo 2012).

Economy is the study that deals with the distribution of goods and services in a society such that the concept of welfare is maintained (Nelson 2008). However, some economics also considered knowledge as part of economic development. Thorstein Veblen termed knowledge an important determinant of economic development as – according to Veblen – material lost could be replaced with the right knowledge but technology was nothing without sufficient knowledge to use it (McCormick 2006). Veblen was of the view that economy was always knowledge-based and human survival was not possible without knowledge (Veblen 1915). The argument was taken further by Dale Neef who defined knowledge economy as a recent concept and added that knowledge was a prime resource (Neef 1998). However, this knowledge-based economy has existed since the existence of making (as proposed by Veblen) and is not a new phenomenon (Khumalo 2012).

6.2 Consequences of Tax Evasion on Political Economy

One of the main aspects of public economics –as explained by Adler – includes how tax efficiency affects the service delivery of the government (Black, Calitz and Steenkamp 2015). Therefore, a sizeable portion of this study includes effects of tax evasion mainly on the service delivery in Pakistan. Tax evasion has shown to be having a significant impact on the economic growth of a country. As tax evasion in an economy increases, the economic growth decreases (Chen, 2003). Moreover, tax evasion also has an impact on the provision of public goods and capital accumulation in the economy. When there is tax evasion in an economy, capital accumulation increases in the hands of entrepreneurs and hence this capital accumulation leads to economic growth as entrepreneurs have more money to invest (Cerqueti and Coppier, Economic Growth, Corruption and Tax Evasion 2009). However, on the other hand – as described by (Cerqueti & Coppier), tax evasion leads to less tax revenue available with the government which will not be sufficient for the government to provide better public goods. This again leads to lower levels of economic growth.

Public service has many definitions and includes many things however, the most important public services include health, education sector and policing (Spicker 2009). However in case of Pakistan these services are not being provided upto required standards. Pakistan ranked 164th out of

195 countries in terms of health and education standards (Lim, et al. 2018). This speaks loads about the situation of these sectors in the country. budget figures also have an alarming situation. A country where more than 40% of the total budget is utilized for debt servicing and 18 to 20% are spent on defense, a mere 5% is allocated to health and education. This situation speaks volumes regarding the level of public services being provided to a population of more than 190 million people. However, spending more than 40% on debt servicing leaves the country with no other option but to save the money from providing public services to the public.

Another issue faced by low revenue collection is lack of financing the Public Sector Enterprises or the PSEs that are run by the government and fed through taxpayers' money (Dalu, et al. 2012). According to Asian Development Bank, the Public Sector Enterprises contributed to 400,000 jobs in the country and are weak in terms of revenue generation to the state (ADB 2017). It is therefore, according to an estimate that the loss incurred by PSEs in Pakistan amounted to PkR. 1.068 trillion as of FY 2018 (Dawn 2018). This situation worsens in a country where only 2% of the total population pays taxes (Memon 2018) while – according to the Economic Survey of Pakistan 2018 - having a Tax-to-GDP ratio of 12.4% and fiscal deficit of 6.8% in the FY 2018. Under these circumstances, the country has to go to external agencies for loans on strict conditions. According to the budget analysis of the country available at the Ministry of Finance website, the last five years analysis shows that more than 40% of the total expenditure carried out by the Federal Government is in debt servicing. The situation is evident from the fact that only in 2017; the Pakistani government signed an agreement with Asian Development Bank for a loan of US\$ 300 million to support PSEs (ADB, 2017). Similarly, the debt to PSEs in Pakistan is also a major concern for the government of the country. According to an estimate, the net debt of PSEs was PkR 1.4 trillion in the Fiscal Year 2018 that increased to 2.1 trillion in the year 2019 – an increase of 47% (Rana, Public sector enterprises debt increases by 47% in one year 2019).

The other impact as pointed out by Dalu et, al. was inflation. According to them, tax evasion leads to accumulation of wealth that causes a large amount of cash into the hands of entrepreneurs. As a result, there is a large amount of cash available in the market that is chasing less number of

goods. This phenomenon falls into the definition of inflation where too large money is chasing too few goods. As discussed in the previous sections of the study, people comply with taxes mostly due to the fear of penalties n taxes evaded. This is evident from the fact that the relationship between tax evasion and fear of penalties on tax evasion was significantly negative. Tax evasion that creates inflation has an added advantage. Tax evasion being done at a time t is audited at a later time. Hence future value of evaded money sometimes lower than the penalties imposed after the audit is carried out, therefore, people find it beneficial to evade and keep the fines being imposed at a later time (Caball'e and Panade's 2004).

The case of Pakistan is not different as inflation and tax evasion have shown to have a significant relationship with each other. A study carried out by Khan et, al. took a time span from 1972 to 2006 and concluded that tax revenue was one of the main factors significantly effecting inflation in the country with lower tax collection leading to higher inflation (Khan., Ahmed and Hyder 2007). Another study by took the same time period and revealed the same results. According to the study, money supply that is indirectly related to tax evasion as shown by (Cerqueti & Coppier, 2009) was a significant indicator of inflation in pakistan (Khan and Gill 2010). Similarly, Bashir et, al also presented the same results and suggested that taxation is an important determinant of inflation in the long run (Bashir, et al. 2011). The study took a time series analysis 38 years and concluded that tax collection was significantly related to inflation in pakistan.

Supply of money has also been thought of as a major deteminant of inflation in an economy. According to the quantity theory of money presented by (Fisher, 2006), quantity of money in an economy is directly responsible for inflation. Fisher argues that as quantity of money increases, the price level increases which increases inflation. Keeping all other factors constant doubling the quantity of money in an economy would double the inflation (Bashir, Yousaf, & Aslam, 2016). Whenever tax evaion is on the rise, companies and individuals have more money at their disposal from which they declare more profits and dividends (Macharia 2014). This factor leads to increased quantity of money in the hands of individuals and hence due to increased quantity of money inflation in the ceonomy increases (p. 36).

Public Debt has a negative relationship with economic growth. Tax evasion reduces government revenue and is a main source of fiscal deficit

that further leads to increase in government debt in order to finance the deficit (Pappa, Sajedi and Vella 2015). Government debt is a burden on economies large and small and all economies including USA, European and other developing nations face the issue of fiscal deficit which ultimately leads them to go for debt (Marakbi and Villieu 2018). According to the budget analysis for the last five years, Pakistan's budget deficit in the FY 2017 – 18 stood at PkR. 2.3 Trillion that was increased to 3.444 trillion in the FY 2018-19.³ In order to finance these deficits, the government has to take loans through both internal and external borrowing.

According to estimates, the total public debt of Pakistan in the FY 2019 was around PkR. 33.4 trillion with an increase of 21% in the year amounting to PkR. 6 trillion (Rana, 2020) An estimated 40% of the total expenditure of the Federal government as evident from the budget statements is paid as debt servicing of these borrowings by the government. Now comparing it with the tax gap of 3.3 trillion, this deficit can easily be catered for if tax evasion is controlled.

According to IMF Report⁴ the total tax evasion in Pakistan was estimated to be PkR. 3.3 trillion. Hence, PkR 3.3 Trillion was being circulated in the economy and was not being transferred to the government which has a double effect. First of all, as stated by Macharia, the quantity of money increased to PkR. 3.3 Trillion as a result of money being saved from taxes and kept with the investors themselves. This money that could have been used for provision of goods and services was washed away. Secondly, the money does not go to the government institution who are responsible to provide public services. Hence the quality of goods and services provided by public sector remain poor and this calls for political issues. When private sector engages in tax evasion.

7 Conclusion and policy recommendations

Tax evasion is an important phenomenon associated with the economy of Pakistan. Like many other countries, the main source of government revenue in Pakistan is through taxation. More than 90% of Federal Government revenue is collected through tax collection. According to

³ Economic Survey of Pakistan 2019

⁴ Selected Issue Paper issued with Ninth IMF Review Report in 2016

World Bank estimates, the Tax Gap of Pakistan stood at 50% most of which is due to tax non-compliance of its citizens and that is a hurdle in its economic development. The study has suggested several consequences of tax evasion and its resulting poor tax collection. First of all, tax evasion leads to lack of effective provisioning of public services to its citizens. Public services that are an essential especially in case of developing nations and has many political and economic implications include health, education and road infrastructure. Poor tax collection by the government reduces resources to fund those essential services that further to the agony of its citizens.

Apart from the public service delivery, Pakistan also has to support some PSEs including PIA, Pakistan Railways and many other organizations that run in losses due to administrative issues and need government support to perform their operations. The government has to support for the losses for these PSEs that again becomes a problem for the government due to shortage of funds due to poor revenue collections by the government due to tax evasion and other non-compliance behaviors of its citizens. However, in order to fund these loss making PSEs, the government has to resort to painful injections of internal and external borrowing so that these corporations keep on providing services to the citizens.

When tax is evaded, money remains into the hands of individuals. This increases quantity of money supply in the economy hence creating inflation. Inflation in turn creates price hike and the overall price level increases. Borrowing is another consequence of tax evasion in countries like Pakistan. Pakistan, in order to provide public services and finance its PSEs has to borrow money required through internal and external borrowings. These borrowings create a vicious circle as the government has the responsibility to service these debts and pay huge chunk in payments of installments and interests to internal and foreign bodies like the IMF, World Bank, Asian Development Bank etc. According to budget estimates approximately 40% of expenditure is incurred in debt servicing.

As evident from the literature, tax compliance and public service delivery have a complex relationship with each other. On one hand increase in tax compliance leads to improved health and education services as the government has more revenue at its disposal to provide such services (Myles, 2000) while on the other hand, raising too much taxes may lead

to problematic situation where most lower income taxpayers may not be able to pay their share and may indulge in evasion (Kar and Banerjee 2018). It is therefore, suggested that the best way is to keep taxes as such it is affordable by almost all segments of the society. The best way is to enforce progressive taxation so that every person shares the burden according to his level of income (Timmons 2005).

Similarly, sourcing the PSEs is another big challenge for the government especially when tax non-compliance is high in a society. One of the solutions is to privatize the public enterprises that will reduce the burden of these loss making PSEs like PIA and Pak Railways. But on the other hand literature has also suggested that such a transfer of ownership leads to accumulation of profits into the hands of private sector who then resort to higher prices which ultimately leads to going away of these services from the reach of most citizens (Naqvi and Kemal 1991). However, the government has made attempts to privatize these loss making entities but the plan has always been politically criticized and the decisions have been thwarted (I. Khan 2019)

Inflation is another issue that needs to be tackled as a result of tax evasion. as evasion increases, the extra money that remains into the hands of the private sector increases demand for products and ultimately an increase in the overall price level in the economy. It is therefore suggested that tax compliance may be given due consideration at all levels of the government to curb the menace of tax evasion and indirectly to control inflation that may be a cause of many other evils in a society. As suggested by (Halkos and Papageorgiou 2020), the government needs to tackle the corrupt practices including tax evasion so that accumulation of wealth into the hands of private sector is mitigated as this is the only best solution available to control inflation or price hike in the economy.

If all the above issues affiliated with tax non-compliance are catered for, another consequence namely the public debt will automatically be resolved. Public debt is a situation when the government resorts to borrowing of money from external parties like domestic or international donor agencies. When budget is prepared, the government's top most priority is to repay these loans or parts thereof before allocation of remaining funds. It is interesting to note that PkR. 6 trillion was borrowed by the government in the fiscal year 2018 - 19 while the tax gap for the same year stood at PkR. 4 trillion (Mehboob 2019). Therefore all the

government needs is to push up efforts to reduce the tax gap by effectively utilizing its tax machinery and beef up its tax collection rather than going for internal and external borrowings.

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