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THE EFFECT OF COVID-19 DEATHS ON STOCK TRADING VOLUME IN PAKISTAN STOCK EXCHANGE (PSX)

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ABSTRACT

This study's goal is to determine how COVID-19 affects Pakistani stock trading volume on the PSX-100 Index. This study uses a descriptive design to analyze the impact statistically and is quantitative in nature. There are four variables in the study: three independent and one dependent. The current study's data covers daily COVID-19 deaths, recoveries, and positive cases between February 26, 2020, and March 10, 2021. The study's conclusions suggest that COVID-19 manipulates the volume of stock trades on the Pakistan Stock Exchange. Future studies are needed on the following topics: economic growth, interest rates, exports and imports, consumer spending, and inflation.

Keywords: Deaths cases, Recoveries, Confirm cases, Stock Trading volume.

INTRODUCTION

During a given period of time the total number of shares of a security that were traded is the trading volume. When an investor sell a security due to low activity and take profits trading volume can signal.

Security that shows the ownership of a fraction of a corporation which is known as stock or equity. The difference in price of an asset, outlay, which may be represented in expressions of price change or percentage change, is known as return. Shares are the units of stock (2018).A Price varies as well as dividend and interest payment is equal to total return. The set of markets and exchanges refers to stock market companies where shares of publicly-held are sell, buy, and issued on normal basis. Stock entitles the container to a section of the corporation's profits and assets equal to how much stock they own. Throughout institutionalized formal exchanges or over-the-counter (OTC) market places do financial activities which run in a clear set of laws. In a state there can be a number of stock trading venues which allow dealings in stocks. By Amy Hi-(Rehman, et al., 2020) Corona virus belongs to the relatives of corona-virdae. Corona virus was the first time arrived in Wuhan city, on December 2019. First five days of the epidemic an arising business centre of China well-informed the corona virus epidemic, more than 1,800 people kill and more than 70,000 people infected. The spine of every economy is do business it brings the overseas reserves to hold exchange rate and the balance of payment in the country. The businesses decided to close the industries which cause to withdraw the economy after this pandemic beat Pakistan. The changes copy the stock markets before when a major problem hit the country. The stock market starts declining when the polluted cases reported in Pakistan, on March 19 it hits its least value in the last 5 years. This un-foreseen decline is the main cause of virus condition which urges the overseas investors to remove their foreign portfolio investments. Industries are affecting by the lockdown and stock market make this stress due to COVID-19.Resultantly in start of this in doubt situation the stock market has shown a failing style. On February (26th2021) Prime Minister's health assistant confirms that two persons had been diagnosing with current pandemic these two people to have visit to Iran. In Karachi the first patient of corona virus active, as the second patient was from the federal area of the country. Pakistan confirmed three other cases at the end of February.

On March 2nd, old 45year- female from Gilgit-Baltistan have travel from Iran was the fifth corona case belongs to federal area of the country. By the story of Asian Development Bank during the occurrence of COVID-19 the economy of Pakistan to go down about $16.387 million to $4.95 billion. Pakistan fabric sector relies on overseas countries for the largeness put in of its capital goods. Masses of overseas textile industry were stopped due to epidemic which will definitely affect cloth sector of Pakistan. During the deadly disease period, Pakistan Stock Exchange (PSX) is experience main decline. More than five years the PSX cut down to its bottom on March 19. During instability and confusion several trade of (KSE) 100 index suffer standstills these days to maintain investors.

All companies generate bad raw returns but mainly suffer throughout the last one-month goods and Services, Power, Transportation, Chemical, Banks and Automobiles. For example the petroleum market is made up of some oil firms that will fail in a disaster, and transport corporations are falling both human crowed and transportation. Those companies which are linked to the medical field have been clear champion in other countries but Pakistan are perform well as compared to other industries, as demand for services that help jobs at home have skyrocket. Significantly Utilities have benefit possibly because these companies which are largely local depend less on foreign market. Asia's best-performing market has been confirmed The Pakistan Stock Exchange (PSX), as a development local economist view clue the country's otherwise contracting economy improving., marketcurrentwealthnet.com, in its, also confirmed the world's fourth best-performing market is (PSX) this report is done by global markets research firm New York-based. The fourth-best-performing stock market in the world is Pakistan's stock market is, the report is recorded by Denmark and Pakistan, in 2020 amazing stock markets that outperformed.

Problem Statement

The COVID-19 pandemic has caused significant disruptions in global markets, prompting an urgent need to investigate the relationship between the number of COVID-19 deaths and stock trading volume. Understanding how the severity of the pandemic, as reflected in the death toll, influences trading activity can shed light on investors' response to the health crisis and provides valuable insights into their behavioural patterns during such extraordinary events. By examining the impact of COVID-19 deaths on stock trading volume, this research aims to uncover the extent to which investor sentiment and market dynamics are influenced by the severity of the pandemic, thereby aiding market participants, policymakers, and researchers in their decision-making processes.

RESEARCH OBJECTIVE

Objectives of the study are given below:

- To discover out the impact of COVID-19positive cases on stock trading volume.
- To find out the effect of COVID-19 deaths on stock trading volume.
- To find out the effect of COVID-19 recoveries on stock trading volume.

RESEARCH QUESTION

Questions of the study are given below

- Does a COVID-19 positive case affect the stock trading volume?
- Does aCOVID-19 death affect the stock trading volume?
- Does a COVID-19 recovery affect the stock trading volume?

Significance of the Study

The pandemic has impacted the sectors unequally, however; the services sector has been hit the hardest, followed by the manufacturing and the agriculture sector. Within the services sector, entertainment, hospitality, tourism and logistics have all suffered substantial losses in revenue. The industrial countries have the main purpose to catch the awareness, interest of the foreign investor and to make investment in own their country. While every develop nation like Pakistan to catch the attention and interest of all overseas investors for the reason of trying to improve their stock trading volume and economic condition of the state which is suffer during the phase of covid19. The reason of this study will inform the policy creator that how will be the stock trading volume get enhanced that is openly related with the country economy like GDP,GNP,PER CAPITA income. The impact of COVID-19 deaths on stock trading volume is a

significant area of study with implications for various stakeholders. This research holds importance for investors, managers, academics, and policymakers in the following ways.

THEORETICAL REVIEW

Before explaining the cause of COVID-19 deaths, recoveries, conform cases and test going on trading volume in Pakistan stock exchange (PSX).It is necessary to review the theoretical perspective regarding the study variables.

(Abdullah et al., 2020) was conducting a study about contagious infection disease & Deaths, impact of Covid_19 germ on stock market return. The reason of the think about is to investigate the contagious infectious disease and death which effect the stock market return during the period (2020).The researcher was assemble the data from the following companies which include, shanghai stock exchange and Hang-sang index. The variables uses by the investigator for the study are Covid-19 as independent variable while Hang-sang index and shanghai stock exchange as dependent variable. Methodology use by the researcher in this study for the collection of data, to compute the effect of covid-19 virus the researcher used data regression model. After this procedure the researcher find out that the contact of epidemic infection was negatively affect the return of the stock market.

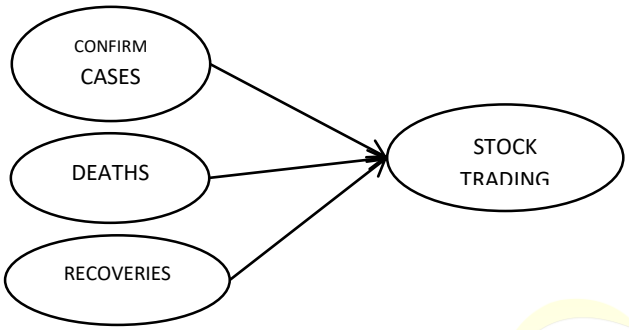
(Steven J.Davis et al., 2020) was conducting a study about the firm level risk exposure and stock return in the wake of COVID-19. How previous risk exposures interact with market available shocks to force the structure of firm level equity return this was main plan of the study. This study focus on 17-trading days with larger market moves this means that the researcher collect the data from late February to the stop of the March (2020). The variables of study used by investigator as covid-19 as a independent variable while stock return and firm level risk exposure as a dependent variable. The Draw on two text-analytic approaches frequently seen as alternatives expert-curetted dictionary method and supervised machine learning was the methodology of the study. After the whole process the researcher conclude that these 17 trading days to show a huge dispersion in firm_ level returns in the reaction of COVID-19 news arrival.

(Mieszko et al., 2020) was conduct/explore the study about & the March (2020) market crash proof from S&P1500 & covid-19. This study has two main objective, first one is to look at the implication for the stock price volatility & second objective is the performance of US stock market crash in march (2020) make active due to corona virus. Primary data was used by the researcher to examine the firm immediate responses to covid-19 during the month of March. The researcher was take four variables of the study which involve chemical sector, petroleum sector, and firms in natural gas and these three were used as dependent variable and covid-19 as (DV).In 1989 Peterson discover the 'event-study' method this was the methodology for the study select by the researcher. The effect of COVID-19 is collapse the price of stock for the duration of March 2020, this largest market crash in history was conclusion. ALAM, A. (2013).

(Haitiam El-Busoni, 2020) explore the study about cause of Covid_19on Arab Monetary Markets Prove from KSA & Egypt .The goal of study is the impact of the COVID-19 on the Arab Financial Markets. Data conduct from the period of first April 2020 to 21th May 2020 in Egypt and KSA. Trading volume is dependent variable of the study while COVID-19 confirmed cases and death cases independent variable of the study. Methodology of the study is used simple regression in double log and linear models. The conclusion of this study theoretical relationship between the affirmed cases and passing cases from COVID-19, the trading volume is negative.

(Paresh Kumar et al., 2021) was conduct a study about is there a pattern in how covid-19 has affected Australian stock return. How covid_19 has impacted the Australian stock return is the goal of the study. The researcher collect the data on daily basis using time-series during the month of 1,April2020 to 10,Sep2020 on the Australian stock market return this data was consists of 2810 daily observation and its cover the sample during the month of come to a head. The variables used the researcher for the study, which are COVID -19 is an independent variable while tail is used as dependent variable. The story about tail in a distribution tell of the country of the market that is the tail identify the phases when the market is doing well and phases when it is not doing well covid-19 is likely to effect the tail. Quintile

regression framework was used for a study model. The end result shows that the stock market on the Australian market is diverse effected due to Covid-19 while consumer staple sector and health information technology have benefit from the virus.
By this study (Colombo, E., and Pelizzon, L 2021) there is evidence to suggest that pandemics can influence stock market performance, the relationship is complex and can be influenced by various factors. It is challenging to draw definitive conclusions or make accurate predictions solely based on historical observations, as each pandemic is unique and market dynamics evolve over time.



HYPOTHESIS

Based on the above discussion, below hypothesis are developed for the study

H_1: There is relationship between coved -19positive cases on stock trading volume.

H_2: There is a relationship between covid-19 deaths on stock trading volume.

H_3: There is a relationship between covid-19 recoveries on Pakistan stock trading volume.

METHODOLOGY

Confirm Cases

The relationship between COVID-19 confirmed cases and stock trading volume is complex and can be influenced by multiple factors. Generally, a significant increase in COVID-19 cases can lead to higher trading volume due to increased market volatility and uncertainty. The relationship between COVID-19 cases and stock trading volume is not deterministic, and daily fluctuations are influenced by various factors, while long-term trends are shaped by a broader range of economic indicators and market sentiments.

Deaths

It's important to note that the relationship between COVID-19 death cases and stock trading volume is not straightforward or deterministic. Market dynamics are influenced by a wide range of factors, and trading volume is shaped by a complex interplay of economic indicators, government policies, investor sentiment, and other global events. Therefore, while death cases are a significant aspect of the pandemic, they are just one component among many that can affect stock trading volume.

RECOVERIES

It's important to note that the relationship between COVID-19 recovery cases and stock trading volume is not deterministic. Other factors, such as economic indicators, corporate earnings, and global events, also play significant roles in shaping market dynamics and trading volume. Therefore, while COVID-19 recoveries can impact market sentiment, they are just one aspect among many that influence stock trading volume.

Proposed Model

$LSTV=\beta_0+\beta_1 LPOS+\beta_2 LDC+\beta_3 LREC+ut$

STV represent the dependent variable, which is stock trading volume, while POS'DC' REC represent the independent variable and ut is the error term.

Research design

The goal of current study is to look at the covid-19impact on stock trading volume in Pakistan Stock Exchange (PSX) therefore the quantitative type of research is choose to get the objective. Time- series data is available for this study. Similarly the data is collect and analyse for the given period of time to achieve the study objective. E-views are used for data analysis.

Population

The population is based upon13 months of daily observation of covid-19 deaths, recoveries, and confirm cases on stock trading volume in Pakistan Stock Exchange (PSX). Secondary data is used for the period of 26thFeb, 2020 to 10thMarch, and 2021

Sampling Design

Time series data is use from April, 2020 to December, 2020 of top companies listed in the

Pakistani Stock Exchange (PSX 100 INDEX).E.g. Textile industries, Transportation, beverages, Pharmaceutical companies, Millet tractors etc

Model specification

The model is used in this study is bivariate regression.

Y=(X)----(1)

Y=(POS,CD,REC,)----(2)

Y=stock trading volume.

POS= Positive cases

CD=COVID deaths in numbers

REC=Recoveries

For removing the skewness and achieve homoscedastic data is move to log form as shown equation 3.

$LSTV=\beta_0+\beta_1LPOS+\beta_2LDC+\beta_3LREC+ut$ (3)

Where the error term is ut, β0 is the slope, and coefficient estimate of independent variables is β_1, β_2, β_3,

Stationary Test

Unit Root Testing

Stationary level of data the other name of unit root confirm that, before going to correct co integration is very important. It is the property of stationary to affect the behaviour of full time series information. The determination of shock will be incalculable, result are bound to fake in regression later on malice in case of data with unit root having a high r^2 value, in addition the division will not follow by the ration. Whereas, the shocks will be maximum across the time if the data has no unit root, in addition there will be no difference across the time in the variance, mean and autocorrelation. The stage of integration is not of order 2 is to confirm ,Augmented Dickey-Fuller (ADF) unit root test discover by (Dicky &Fuller 1979)use in this study.ADF model will be used in this study used which is known in the following equation 4,5and 6 in that order as:

(With no constant and trend) **(4)**

(With constant and no trend) **(5)**

(With constant and trend) **(6**)

Where, ΔYt=Yt-Yt-1

The four variable trading volume and positive cases CD, Recoveries, and YT is the deterministic style and this Yt represent the preceding variables, the time period is t, the constant is α0, and the stochastic error term is μ.

CORRELATION

If there is correlation found among the two variables it shows that the one variable is change systematically, and the other variable is also change systematic, the variables change together over a certain period of time. It depending upon the numerical values measured, this can be either negative or positive.

Co Integration

The long-run relation would be search in this study would among stock trading volume and COVID deaths, recoveries, confirm cases and tests. Pesaranet al. (2001) was recommended the following Autoregressive Distributed Lag (ARDL) bounds method. This model can utilize with no analyzing the stationary in data in terms of Pesaran and Peseran (1997).As compare to co integration test like, Engle and Granger (1987) and Haug(2002) for the data set of small size result the ARDL is consider to be tough one. In terms of Laurence son and Chi (2003) as to specific approach from general the model ARDL is very supportive, capturing the clear ARDL and ECM to the data generating process takes the satisfactory lags level. Decision about co integration presence in F-stat and ARDL bounds test value will be analyzed between the variables with the bounds of higher and minor critical. If value of F-stat is more as compared to high bound Co integration exist, if minor than minor critical bound then there will be no co integration exist and the value is between upper &lower bounds the result will be uncertain that is for fear in terms of (Pesaran et al.2001). To get a general idea of short-run, ECM will be analyzed under ARDL. It also tell through mistake correction term factor load or (ECT) about the speed of correction. A number of diagnostic tests like, Histogram-Normality Test, and serial correlation, Heteroskedascity, practical form such as stability diagnostic test and Ramsay RESET like CUSUM of squares and CUSUM apart from co integration performed these tests. Canonical co integration regression (CCR) and fully modified ordinary least squares (FMOL) will also be use in the study for

$\Delta LSTV=\alpha 1+\sum \alpha i\Delta LSTV^{t-1}\sum \alpha a\Delta LPOSt-a+\sum \alpha b\Delta LDCt-b+\sum \alpha c\Delta LRec-d+\gamma 1LSTV+\gamma 2LPOS+\gamma 3LDC+\gamma 4LRec+\varepsilon 1t \quad i=1 \quad \alpha=0$

The cointegration hardness. Stock trading volume (STV) and the incorporation of clear lag of repressors with dependent variable are the ARDL models.

Model 1

The first difference operator is Δ,α1 is the open intercept αn, n=(i,a) are the coefficient of short term, for the coefficient of long-run stands γ and the terms a white noise mistake represent by εt. From the equation 8 the guess of dynamic error short-run correction term can be deducted as following.

$$\Delta LSTV = \alpha 1 + \sum_{i=1} \alpha i \Delta LSTV^{t-i} + \alpha a \Delta LPOSt-a + \alpha b \Delta LDCt-b + \alpha d \Delta LRECt-c \lambda ECTt-1 + \varepsilon 1t$$

The error of correction term is ECTt-1 and λ stand for the speed of adjustment.

In this study the major long-run co integration method is ARDL and COVID deaths has impact on the performance of stock exchange will be decide in present study, therefore equation will be processed only (Model-1).

Diagnostic Tests

The reality of model is to observe with the help of diagnostic tests of a serial correlation, functional form, normality, and hetroskedasity. For the stability of the model Pesaran and Pesaran (1997) suggest conducting Brown et al. (1975) cumulative sum (CUSUM) and the cumulative sum of squares (CUSUMSQ) test. The model is tested by the diagnostic and stability tests for the goodness of fit of the model.

Granger Causality Test

It is a statistical hypothesis test to determine whether a time series is a factor and provides useful information for predicting another time series.A time-series information based approach in arrange to decide causality Proposed by Granger (1969).In this framework ''useful" implies that x is able to extend the precision of the forecast of y with regard to a figure, considering as it were past values of y. In logic of Granger- x is a cause of y which is useful in forecasting y. The Granger causality test is useful for examining causal relationships between variables in a time series context. You can apply this test to assess if COVID-19 deaths, confirmed cases, or recoveries Granger-cause stock trading volume, indicating their predictive power for stock trading volume changes.

Analytical Tool

In direct to find the shock of independent variable on dependent variable use different analysis technique, we will use unit root tests, causality test& co integration to check the stocks performances relationship to COVID-19 deaths, while for business control specific characteristics. SPSS will be used for analysis.

Variable Measurement

This study is based on the following variable. Stock trading volume is the dependent variable for this study while Positive cases, COVID-19 deaths, and recoveries are the independent variable for this study.

DATA ANALYSIS

Descriptive Statistics

Agreeing to the expressive measurements, it can be watched that normal priceof PSX 100Index has remained 25, 473.61 focuses amid the first half of 2020.During first of 2020 the average number of Positive cases (POS) is 26, 317, the number of average death cases (DC) is 531 and, the average recoveries (REC) are 9,273 on daily basis during the same time period. During the first half of 2020, the most extreme index price was 30, 058 focuses where the least list cost was 20, 044. Through the first half the maximum number of positive cases are 192, 970 and that of death cases and recoveries is 3903 and 81, 307, respectively. The lowest index price was 20, 044during the first half of 2020 and this examination has been drawn on the premise of 119 perceptions.

Descriptive Statistics

	LSTR	LPOS	DC	REC
Mean	25473.610	26316.620	530.689	9272.882
Median	24614.020	1197.000	9.000	75.000
Maximum	30058.450	192970.000	3903.000	81307.000
Minimum	20043.890	0.000	0.000	0.000
Srd. Dev.	2812.642	48820.800	969.338	18644.430
Skewness	0.141	2.089	2.030	2.309
Kurtosis	1.870	6.302	6.120	7.489
Observation	270.000	270.000	270.000	270.000

Unit Root Analysis Augmented Dickey Fuller (ADF)

Table 4.3 shows the unit root analysis under augmented test concerned variables. it is evident that at levels the variable of STV,DC, and REC POC are stationary whereas the variable of POS is non-stationary by taking the first difference the results

clearly shows that all the concern variable become stationary. To confirms the results of ADF test a verification test [PP] unit root analysis is also done in table 4.4 shows that all the variables are non-stationary except STVwhich is stationary at levels structured. By taking the first difference it is evident all the variable become stationary. Thus table 4.4 of PP test confirms the ADF test. Based on the provided Philips Peron (PP) unit root test results, we can analyze the stationary properties of the variables at the level and first different

At Level:

With Constant:

For LSTV (Stock Trading Volume), the t-statistic of -2.9249 (p-value of 0.0438) suggests that LSTV has a unit root at the 5% significance level. For LPOS (Number of COVID-19 Positive Cases), the t-statistic of -2.2919 (p-value of 0.1754) indicates that LPOS also has a unit root but is not statistically significant at conventional levels. For DC (Number of COVID-19 Deaths), the t-statistic of -1.7314 (p-value of 0.4143) suggests that DC has a unit root but is not statistically significant. For REC (Number of COVID-19 Recoveries), the t-statistic of -2.6223 (p-value of 0.0897) indicates that REC has a unit root but is not statistically significant at conventional levels.

With Constant & Trend:

For LSTV, the t-statistic of -5.0426 (p-value of 0.0002) suggests that LSTV does not have a unit root and is stationary. For LPOS, the t-statistic of -2.2874 (p-value of 0.4389) indicates that LPOS still has a unit root and is not statistically significant. For DC, the t-statistic of -1.7280 (p-value of 0.7363) suggests that DC still has a unit root and is not statistically significant. For REC, the t-statistic of -2.3881 (p-value of 0.3849) indicates that REC still has a unit root and is not statistically significant.

Without Constant & Trend:

For all variables (LSTV, LPOS, DC, and REC), the t-statistics are not statistically significant, suggesting that they all have unit roots and are non-stationary.

At First Difference:

With Constant:

For d (STV) (First Difference of Stock Trading Volume), the t-statistic of -9.1182 (p-value of 0.0000) indicates that d(STV) does not have a unit root and is stationary. For d(POS) (First Difference of Number of COVID-19 Positive Cases), the t-statistic of -2.6309 (p-value of 0.0880) suggests that d(POS) has a unit root but is not statistically significant at conventional levels. For d(DC) (First Difference of Number of COVID-19 Deaths), the t-statistic of -9.6048 (p-value of 0.0000) indicates that d(DC) does not have a unit root and is stationary. For d(REC) (First Difference of Number of COVID-19 Recoveries), the t-statistic of -11.6399 (p-value of 0.0000) suggests that d(REC) does not have a unit root and is stationary

With Constant & Trend:

For all first difference variables (d(STV), d(POS), d(DC), and d(REC)), the t-statistics are statistically significant, suggesting that they do not have unit roots and are stationary.

Without Constant & Trend:

For all first difference variables (d(STV), d(POS), d(DC), and d(REC)), the t-statistics are statistically

Unit Root Analysis Augmented Dickey Fuller (ADF)

At Level					
		LSTV	LPOS	DC	REC
With Constant	t-Statistic	-4.2718	-2.3385	-8.7589	-5.7571
	Prob.	*0.0006*	*0.1607*	*0.0000*	*0.0000*
		***	n0	***	***
With Constant & Trend	t-Statistic	-4.7910	-2.2877	-8.7617	-6.3995
	Prob.	*0.0006*	*0.4388*	*0.0000*	*0.0000*
		***	n0	***	***
Without Constant & Trend	t-Statistic	0.5391	0.4375	-4.6908	-0.4400
	Prob.	*0.8319*	*0.8077*	*0.0000*	*0.5233*
		n0	n0	***	n0
	At First Difference				
		d(STV)	d(POS)	d(DC)	d(REC)
With Constant	t-Statistic	-25.4080	-21.7762	-54.8930	-43.1792
	Prob.	*0.0000*	*0.0000*	*0.0001*	*0.0001*
		***	***	***	***
With Constant & Trend	t-Statistic	-25.3331	-21.7627	-54.7603	-44.2209

	Prob.	*0.0000*	*0.0000*	*0.0001*	*0.0001*
		***	***	***	***
Without Constant & Trend	t-Statistic	-25.3659	-21.6976	-54.2826	-43.0063
	Prob.	*0.0000*	*0.0000*	*0.0001*	*0.0001*
		***	***	***	***

Unit Root Analysis Philips Perron (PP)

At Level

		LSTV	LPOS	DC	REC
With Constant	t-Statistic	-2.9249	-2.2919	-1.7314	-2.6223
	Prob.	*0.0438*	*0.1754*	*0.4143*	*0.0897*
		**	n0	n0	*
With Constant & Trend	t-Statistic	-5.0426	-2.2874	-1.7280	-2.3881
	Prob.	*0.0002*	*0.4389*	*0.7363*	*0.3849*
		***	n0	n0	n0
Without Constant & Trend	t-Statistic	0.4020	-0.0107	-0.7004	1.0045
	Prob.	*0.7988*	*0.6783*	*0.4127*	*0.9170*
		n0	n0	n0	n0

At First Difference

		d(STV)	d(POS)	d(DC)	d(REC)
With Constant	t-Statistic	-9.1182	-2.6309	-9.6048	-11.6399
	Prob.	*0.0000*	*0.0880*	*0.0000*	*0.0000*
		***	*	***	***
With Constant & Trend	t-Statistic	-9.1000	-2.5886	-9.5876	-11.6933
	Prob.	*0.0000*	*0.2859*	*0.0000*	*0.0000*
		***	n0	***	***
Without Constant & Trend	t-Statistic	-9.1215	-2.6419	-10.5336	-11.5316
	Prob.	*0.0000*	*0.0082*	*0.0000*	*0.0000*
		***	***	***	***

CORRELATION ANALYSIS

Table shows that Co-relation between the concerned variables shows that the relationship between Positive Cases (POS) and Death Cases (DC) have insignificant weak correlation with Stock trading Volume (STV), Whereas recoveries Cases (REC) have significant but a weak relationship with Stock trading Volume (STV). From the below Table we assumed that in some situations the stock trading volume have significant relationship with the concerned variables.

Correlation Analysis

	LSTV	LPOS	DC	REC
STV	1.000000	-0.282481	-0.277098	0.100214
POS	-0.282481	1.000000	0.773438	0.685219
DC	-0.277098	0.773438	1.000000	0.550520
REC	0.100214	0.685219	0.550520	1.000000

VAR Lag Order Selection

Before the estimation of equation no 3 is required to determine the optimal lag order, the estimation of the VAR model identifies the optimal lag as 5 according to the AIC criterion shown in Table

VAR Lag Order Selection

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-2059.877	NA	51.23744	15.28798	15.34129	15.30939
1	-1448.242	1200.617	0.621496	10.87587	11.14242*	10.98290
2	-1407.140	79.46418	0.516084	10.68992	11.16971	10.88259*
3	-1383.006	45.94297	0.486006	10.62968	11.32271	10.90797
4	-1368.428	27.32118	0.491332	10.64021	11.54647	11.00412
5	-1348.457	36.83470*	0.477374*	10.61079*	11.73030	11.06034

** indicates lag order selected by the criterion*
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

Dolls Estimation Dependent Variable (STV)

The Dynamic Least Ordinary Least Square DOLS estimationof the study about has been performed within the Table 4.7, which appears that there's a negative and noteworthy relationship between STV and the number of positive cases (POS) of COVID-19. Secondly, there is a negative and significant relationship between STV and death cases (DC). Thirdly, there is a positive and significant relationship between STV and recovery from COVID-19 (REC). 1% rise in POS decreases the STV by 0.30%, 1% rise in the DC decreases the STV by 0.0023%, whereas a 1% rise in the REC increases the LSV by 0.22%.The coefficient of assurance, in this case, is 0.2547 which implies only 25.47% of the variety withinthe dependent variable is explained by autonomous factors which state that the model is not great fit. The Durbin-Watson measurement because is less than 2.00. But the rule of thumb says that if DW value is between 1.5 and 2.5, there is no serious issue of serial correlation, in this case DW is 1.63,

which is acceptable. The F-states value is significant which shows there is no issue of specification of variables.

Dolls Estimation Dependent Variable (STV)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
POS	-0.302524	0.054776	-5.522897	0.0000
DC	-0.002375	0.001086	-2.186406	0.0296
REC	0.224886	0.028867	7.790433	0.0000
C	20.34266	0.330663	61.52085	0.0000

R-squared	0.254706	Mean dependent var	19.60968
Adjusted R-squared	0.246455	S.D. dependent var	0.494870
S.E. of regression	0.429582	Akaike info criterion	1.162430
Sum squared resid	50.01051	Schwarz criterion	1.215038
Log likelihood	-155.8341	Hannan-Quinn criter.	1.183543
F-statistic	30.87159	Durbin-Watson stat	1.632714
Prob(F-statistic)	0.000000	Wald F-statistic	35.66612
Prob(Wald F-statistic)	0.000000		

Residual Diagnostics

Following Figures and tables are some diagnostics tests, to validate the soundness of the model. Figure 4.7.1 shows the residual test. The P-value of Jarque-Bera is 65% which means there is no issue of abnormal residuals. Table 4.7.2 shows the serial correlation test. The P-value of F-stat is 41% which is insignificant therefore there is no issue of serial correlation. The Table 4.7.3 shows the hetroskedasticity test, the P-value of F-state is 35.4% which is also insignificant therefore the estimation has no hetroskedasticity issues. Table 4.7.4 shows the Ramsey RESET test, in which the P-values of t and F states are insignificant (42.12%) confirming no problem of non-linearity. The CUSUM and CUSUM of the square are shown in Figures 4.7.5 and 4.7.6. Since the residuals are within the critical 5% limit, there is no stability problem in the model.

Figure

Jarque-Bera Residual Diagnostic

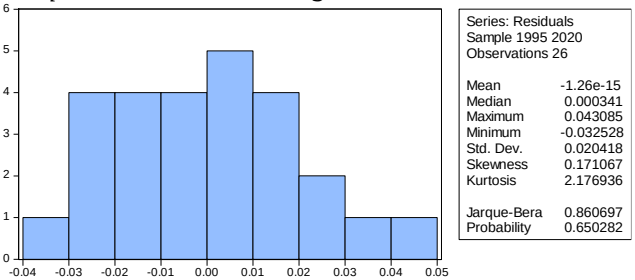


Table 4.7.2

Breusch-Godfrey Serial Correlation LM Test

F-statistic	0.948	Prob. F(2,16)	0.408
Obs*R-squared	2.756	Prob. Chi-Square(2)	0.252

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	1.196	Prob. F(7,18)	0.354
Obs*R-squared	8.254	Prob. Chi-Square(7)	0.310

Ramsey RESET Test

	Value	Df	Probability
t-statistic	0.824228	17	0.4212
F-statistic	0.679351	(1, 17)	0.4212
Likelihood ratio	1.018784	1	0.3128

Figure 4.7.5

CUSUM

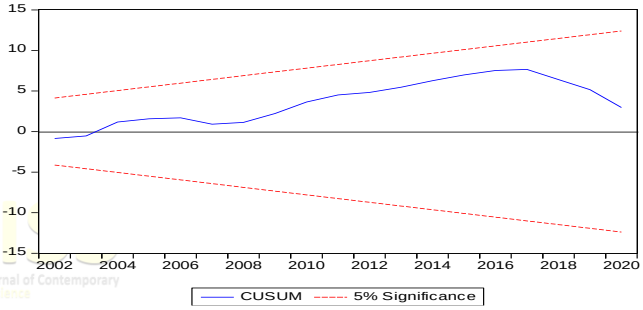
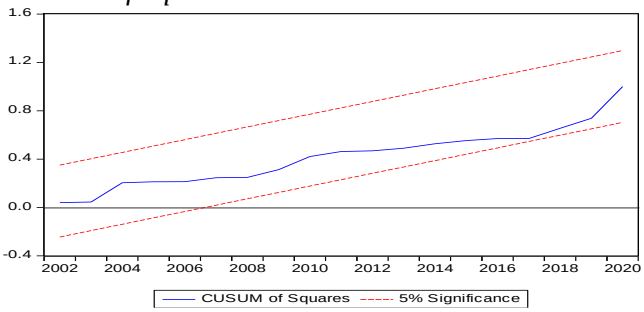


Figure 4.7.6

CUSUM of Square



Toda Yamamoto Granger Causality Test

Table 4.8Shows that lag length criteria is 5. In 2nd step the study will run the long-run causality test in 4.8.1. This table 4.8.1 shows the long run causality analysis between the concern variables. The table shows that in the long run there is the uni-directional causality between recoveries (REC) and stock trading volume (STV) which means that REC causes STV but STV does not cause REC. similarly keeping the death cases (DC) as dependent variable, in the long run positive cases (POS) causes the death cases

(DC).It means that there is a unidirectional causality between positive cases (POS) and death cases (DC). For the dependent variable DC, the Toda Yamamoto causality test shows that POS has a statistically significant causal effect on DC based on the chi-square test statistic and its associated p-value. However, the VAR Granger causality/block exogeneity Wald tests do not find any significant causal relationships from the excluded variables (STV and REC) to DC.

For the dependent variable REC, the Toda Yamamoto causality test does not identify any significant causal relationships from the excluded variables (STV, POS, and DC). Similarly, the VAR Granger causality blocks exogenty. Wald tests do not indicate any significant causal relationships from the excluded variables to REC.

1st Step: Lag Length Criteria

Table 4.8

VAR Lag Order Selection Criteria
Endogenous variables: STV POS DC REC
Exogenous variables: C
Included observations: 267

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-2031.465	NA	49.17683	15.24693	15.30067	15.26852
1	-1420.943	1198.178	0.572405	10.79358	11.06229*	10.90152
2	-1379.938	79.24667	0.474672	10.60627	11.08995	10.80056*
3	-1358.937	39.95646	0.457314	10.56882	11.26746	10.84945
4	-1343.647	28.63312	0.459928	10.57413	11.48774	10.94112
5	-1326.240	32.07575*	0.455385*	10.56359*	11.69217	11.01693
6	-1315.598	19.29067	0.474460	10.60373	11.94727	11.14342
7	-1302.127	24.01552	0.484135	10.62268	12.18118	11.24872
8	-1295.276	12.00932	0.519326	10.69120	12.46467	11.40360

** indicates lag order selected by the criterion*
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

Toda Yamamoto Causality

Toda Yamamoto Causality

VAR Granger Causality/Block Exogeneity Wald Tests
Included observations: 269

Dependent variable: STV

Excluded	Chi-sq	Df	Prob.
POS	2.818407	5	0.7280
DC	4.235915	5	0.5160
REC	11.96222	5	0.0353
All	18.27228	15	0.2486

Dependent variable: POS

Excluded	Chi-sq	Df	Prob.
STV	4.381818	5	0.4546
DC	4.371401	5	0.4973
REC	16.94794	5	0.4958
All	26.52525	15	0.1329

Dependent variable: DC

Excluded	Chi-sq	Df	Prob.
STV	0.831797	5	0.9750
POS	4.030191	5	0.0451
REC	0.887834	5	0.9711
All	5.860806	15	0.9820

Dependent variable: REC

Excluded	Chi-sq	Df	Prob.
STV	3.385895	5	0.6407
POS	6.607737	5	0.2515
DC	0.975312	5	0.9645
All	11.05066	15	0.7490

CONCLUSIONS

Humans and pandemics have a long shared history they return almost after every century and this is happing for a very long time if said that pandemics strikes human race and almost re-shapes its social, political economical and sometimes even religious structures and after every pandemics and the dark days of humanity threatening dark days of pandemics Human race rise, grow and cherish in every aspect of life. This research is been concluded that the impact of Covid19 pandemic and stock trading volume on Pakistan stock exchange. There was a significant relationship between the independent and dependent variables. Data used in this research is taken from secondary source, the researcher use time series data during the period of April, 2020 to December, 2020. Samples are taken from the all top listed companies of the Pakistan stock exchange, i.e. Pharmaceutical, transportation, cement, textile, Fertilizer, commercial banks, oil and gas marketing, glass and ceramics, woollen, lather and tanneries, textile spinning, sugar and allied industries, miscellaneous, automobile parts and accessories, paper and boards, textile waving, refinery, automobile assemblers, leasing companies, modarabas food and personal care product, engineering ,textile composite, cable and electrical goods, insurance, tobacco, synthetic and rayon for the analysis the researcher use bivariate regression model in this study. The result appeared that the 1st half of 2020 has an normal number of positive cases was 26, 317, passing cases 513 and recuperations was 9,273 on day by daypremise.Within theto begin with half of 2020, the highest index price was 30,058 and the lowest index price was 20,044. The top number of positive cases in the first half of 2020 was 192,970, and the number of death cases and recoveries was 3,903 and 81,307

respectively. The conclusive outcome of the study is that both the independent i.e. recoveries cases have significant relationship with stock trading volume but positive and death cases have insignificant relationship with trading volume. Firstly there's a negative relationship between stock trading volume and positive cases, secondly there is a negative relation between death cases and trading volume and thirdly stock trading volume have positive relation with recoveries.

Hypothesis discussion

H_1: There is a negative and noteworthy relationship between stock trading volume and the
Number of positive cases

H_2: There is a negative relationship between STV and deaths cases.

H_3: There is a positive relationship between STV and Recoveries of Covid-19 cases.

Future Directions

Future research is needed to find out how the Covid-19 occasion has affected other Chinese divisions and person companies and their comparing recorded shares Nicholas Apergis and Emmanuel Aperies (2020). Furthermore, the crash the Covid-19 factor could also be inside an asymmetric conditional volatility. The other economic sector of Pakistan is Oilfields Limited, Engro Fertilizers Limited, Millat Tractor limited. These are the top companies on the Pakistan stock Exchange (PSX). This list is published by Pakistan stock Exchange in 2019 and plays an important role in Pakistan economy. Therefore, research is required for economic growth, consumer spending and inflation rate, export and import.

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