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Assessment of the COVID-19 Pandemic's Impact on Gasoline Prices in Pakistan

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Abstract The COVID-19 virus is a pandemic that, from the outset, alters its appearance and symptoms. It has aggressively spread around the world. The COVID-19-induced fear and uncertainty are disrupting the global economy and exacerbating financial market volatility. The most impacted countries were the United States, the United Kingdom, India, and Pakistan. The continuing COVID-19 situation is both a public health and economic concern on a worldwide. This research aims at how the spread of the COVID-19 has affected the cost of gasoline, diesel, and liquefied petroleum gas (LPG). Every week, statistics on COVID-19 instances and pricing are collected. The data was analyzed using the ARDL model and the Bound test to determine the short and long term association between COVID-19 and prices. The Autoregressive distributive lag model findings reveal that confirmed and mortality cases impact fuel, diesel, and LPG prices.

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1 Introduction

The coronavirus epidemic has jolted the world. This virus originated in China (Wuhan city), and the first case was reported in December 2019. Initially, the virus was thought to be merely the flu, but it was subse-

quently shown to be more contagious than other viruses. In terms of appearance and structure, this new virus was unlike any existing virus. More than 25 viral cases have been detected, with all of them being vendors and dealers in the human Seaford wholesale market. Chinese officials began researching it with the help of WHO and discovered it to be a novel virus. The World Health Organization classified this virus as a new coronavirus (2019). The virus attacks the respiratory system. The virus attacks the respiratory system. Coronavirus symptoms include fatigue and fever. This virus spreads at a quicker rate than Ebola virus, and flow virus [1]. On January 30, 2020, WHO labeled it a public health emergency; on February 11, 2020, WHO renamed the novel coronavirus, COVID-19 as new name. On March 11, WHO labeled COVID-19 a pandemic, however it is assessed favorably in many nations throughout the world. This virus is dangerous and deadly. This virus has killed millions of people and impacted millions more. While the virus has endangered people's health, it has also devastated a number of other industries. The pandemic's scope extended beyond the physical and economic spheres. It also showed certain administrations' egocentrism. Due to widespread fear of an uncertain future and its ramifications, many European governments, for example, abruptly halted all food commodity experts and advised the population to stockpile food for several days. People who have witnessed what has occurred and continues to occur may see that people all throughout the world are terrified not just of the illness but also of the pandemic's potential for causing hangers. When the coronavirus was declared a potentially fatal disease and a quarantine was implemented, social media and other sites reported that the virus had spread. Fearing a food crisis or scarcity, people in many economically developing and developed countries waited in long lines to buy and preserve as much food as possible [2]. The COVID-19 epidemic's worldwide economic lockdowns have disrupted the global supply network and reduced aggregate demand [3]. Because to a significant drop in oil usage, international crude oil prices plummeted substantially from US61*onJanuary*2, 2020*toUS*12 on April 28, 2020. Oil prices have a significant impact on the stock market performance of oil-importing countries. A drop in the price of oil decreases production costs and encourages economic development [4]. Prior pandemics, such as SARAS HIV/AIDS, Spanish flu, and the Ebola virus, provide context for how previous epidemics impacted countries' economies. The effects of previous outbreaks and pandemics, including SARS and Spanish flu, were comparable to those of the coronavirus. This epidemic has halted the country's GDP and resulted in a high fatality rate. The Standard Poor's "Goldman Sach Commodities Index" (SP GSCI) commodities price index lost 40.6 % of its value in the first quarter of 2020, while the oil price index fell 56.3 % and the gold price index increased 26.4 %. The sharp rise in gold prices and drop in oil prices during the pandemic shock in the first quarter of 2020 were strong indicators of rising gold demand and declining oil consumption [5]. On February 26, 2020, the Pakistan Ministry of Health announced the first two cases of COVID-19 in Karachi and Islamabad. The number of confirmed cases in Sindh province grew day by day. Pakistan was seen as one of the most susceptible nations because to its shared border with China and Iran, both of which were already affected by COVID-19. Thousands of pilgrims returned, creating a highly dangerous scenario. Pakistan suspended all international flights save those to and from Islamabad, Karachi, and Lahore airports on March 13, 2020, as well as the movement of individuals entering or going to Pakistan from China, Iran, and Afghanistan. The education minister said that all schools and universities would be shuttered until April 5, and later prolonged the closure until May 30. The Pakistani government developed a community known as National Command and Operation NCOC, which prohibited tourism, marriage halls, parks, and public meeting places.

The purpose of this research is to investigate the effect of COVID-19 on the business market in Pakistan, which has included the price of petrol, diesel, and LPG, by using the Autoregressive Distributed Lag Model

(ARDL) to show the relationship between the price of petrol, diesel, and LPG with COVID-19 confirms cases, mortalities, and recoveries. This study will provide the researcher with insight into how COVID-19 affects the country's economic sector.

2 Literature Review

The continuing COVID-19 outbreak is not just a current public health problem; it has also caused a global economic disaster. Many analysts anticipate that this crisis will outlast the 2007-2008 global financial crisis [6]. Qiang, et al. [7] presented the ensemble learning approach and compared the results to the traditional ARIMA model. Furthermore, based on their findings, ensemble learning outperforms the traditional ARIMA model. Furthermore, the author predicted that Pakistan's recovery instances would take fifteen days. Similarly, Ahmadini, et al. [8] utilized Kalman filter on the top four countries: the United States, India, Pakistan, and Russia. The Kalman filter, both smooth and filter technique, follows the real pattern of the data. Furthermore, the authors devote fifteen days to projecting the top four nations with COVID-19 cases. Confirmed cases grow in the United States and India while decreasing in Brazil and Russia; recovered cases increase in the United States, India, and Brazil while decreasing in Russia; and fatalities fall in the United States while increasing in Russia, India, and Brazil. The quick growth in the latest coronavirus outbreak has been investigated. The COVID-19 had a substantial influence on the actual economy and its scope. Typically, an increase in the likelihood of epidemics is associated with a decline in collective claims and a disruption in financial flow. For example, the worldwide Manufacturing industrial income index [9] has declined by 4.5 percent in the first quarter of 2020 as a result of the present COVID-19. Because of the current COVID-19, has dropped by 4.5% in the first quarter of 2020. Several recent studies have launched this field by investigating the financial and market aspects of epidemics [10]. The extensive negative consequence of COVID-19 generated financial hesitancy on US real GDP, whilst Li, et al. [11] present an additional indicator of a clear negative influence on actual GDP growth for a board of 210 nations, as well as a negative stock market reaction. A recent analysis of the literature on the issue indicates that the Brent oil price curve is still in a contagion phase, with long-term oil being more costly than short-term oil [12]. As a result, the pricing varies. There is still a six-month gap between today's delivery contracts and the spread of illness [13]. As a result, it has shrunk significantly during the last two months. When prices fall, the best position for OPEC+ is to modify the shape of the curve from present contagion to future contagion. According to Algamdi, et al. [14] the death ratio in Saudi Arabia has a large and negative impact on oil prices. Resulting the original outcome was impacted mostly by the circumstances of the reported cases in Saudi Arabia. With a steep reduction in prices, the market situation altered, and prices gradually rebounded after June 4. Gkillas, et al. [15] investigate economic insecurity in Canada and sign a beneficial agreement amid the background of economic distress and oil price shockwaves. Basher and Sadorsky [16] investigate the connection between stock prices, product values, and economic turmoil. They utilized nonparametric causality-in-quantile technique and focus on the US budget and discovered a link between oil prices and economic insecurity. The effect verifies the findings of Zhu, et al. [17] which investigated the evading material of oil prices and VIX for expanding market stock prices. The relationship between EPU and oil prices reveals the possibility of an inverse situation. Specifically, Kang, et al. [18] relate a different wavelet change and show that the influence of oil price shockwaves on EPU is positive at all occurrences, which is consistent with Antonakakis, et al. [19] and even the findings stated by Kang, et al. [20], Akanni [21] investigates the relationship between the US EPU and similar financial and economic factors, includ-

ing the oil price. The revelation that the oil quantity shockwaves generated by the US and non-US account for more than 20% of the US EPU differential. The works on the multifractality of symmetric fractal goods marketplaces, specifically in oil and gold, are widespread. Ball and Torous [22] inspect the effectiveness of the gold choice marketplaces and discovery indication besides market uselessness. Bertus and Stanhouse [23] discovered the price gathering of gold in futures. Using functional issue analysis, Narayan [24] displays normal theoretical bubbles of gold in the futures marketplace. Gu, et al. [25] display that gold uses a safety asset besides increasing the oil prices, which can be used to predict and forecast the gold prices, signifying that marketplaces are inefficient. Sharif, et al. [26] noticed that the COVID-19 outbreak has a higher impact on geopolitical risk and economic instability in the United States. These findings show that the COVID-19 pandemic and its complications are real. These crises show a geopolitical danger, and In the future, we advocate integrating the geopolitical risk index. The financial consequences of the COVID-19 outbreak have been studied. With solid connections, COVID-19 is likely to appear at low frequencies. According to the data, it has a long-term negative impact on the levels of geopolitical risk Uncertainty in the economy is the primary source of concern. The US economy's trajectory and the Federal Reserve's response to the pandemic outbreak Second, the oil price drop had the most significant influence on the economy. In comparing COVID-19, EPU, and GPR, US stock markets. Both low and high prices, oil prices were ahead of the US market. Throughout the observation period, there were a variety of frequencies. Finally, Jia, et al. [27] findings reveal that the current evidence in china indicates that the oil price trend towards declining since the outbreak of COVID-19, in particular, the oil price from December to January oil price in china down to 0.72 USD/litre in January from 0.73 USD/litre in December 2019. Mugaloglu, et al. [28] Stated that The explanatory power of market index shocks to the FTSE-OG index return variation increases from 50% to 65 % over the pandemic era, whereas the power of oil and gas sector shocks declines from 37% to 25%. Global oil price shocks have lost nearly a third of their explanatory power, falling to 10%. As a result of these findings, the following conclusions can be drawn. Firstly, Stock market shocks account for most of the variation in the FTSE-OG index return. Secondly, global oil price shocks account for only a tiny portion of the FTSE-OG return variation. Thirdly, structural shocks' explanatory power does not differ significantly between short-term (2–8 weeks) and long-term (100 weeks) variations. Engebretsen and Anderson [29] found that the countries who are net oil exporters are facing a historic double blow: a worldwide economic slowdown brought on by the COVID-19 pandemic and an oil market meltdown, with the benchmark price for US crude oil, the West Texas Intermediate, briefly falling below zero for the first time in history (in April 2020). The authors [8, 30-34] did the most similar work as like our study. The International Energy Agency forecasts that oil and gas revenues for several significant producers will fall by 50% to 85 % in 2020, compared to 2019, based on an oil price of USD 30 per barrel, although the losses could be more significant depending on the future market development.

3 Research Methodology

3.1 Autoregressive-Distributed Lag Model (ARDL)

The Autoregressive-Distributed Lag (ARDL) model proposed by Pesaran et al. (2001) is used in this study to examine the correlations between variables. The ARDL model, an empirical research, has various advantages over other cointegration models.

(1) The ARDL model for small samples (Narayan and Narayan, 2005; Narayan, 2004).

(2) All variables in the ARDL model are believed to be endogenous. It can be utilized when the variables

integrate at the I(0) level, or when just a few variables integrate at I(0), first-order I(1) (Qamruzzaman and Jianguo, 2018).
(3) Furthermore, the ARDL model estimates both long-run and short-run variables concurrently.
The ARDL model takes the following general form:

$$Y_t = \alpha + \sum_{i=1}^{p} \delta_i y_{t-i} + \sum_{i=0}^{q} \beta_i X_{t-i} + \epsilon_{it} \quad (1)$$

We choose the ARDL model since it does not need stationarity of the data.

3.2 ARDL Model Estimation for Petrol Price and COVID-19

The ARDL model may be used to both I (0) and I (1) data. Check that the flaws in this model are not serially independent. It uses only one equation, making it simple to apply and comprehend. This study will provide the researcher with insight into how COVID-19 affects the country's economic sector. The following tables shows "summary statistics" and "summary of ARDL model 1 for petrol price, confirms and deaths of COVID-19" respectively.

Table 1. Summary Statistics

	Mean	Median	Maximum	Minimum	Std.Dev	Observations
PPT	104.41	104.03	117.59	75.35	10.599	50
PD	104.52	107.49	128.25	80.98	12.062	50
PLPG	1370	1330	1834	1051	148.95	50
COVCC	10848	7969	40582	0	9733.15	50
COVD	221.48	147.00	810	0	209.89	50
COVR	9937	6050	40617	0	10428.72	50

The summary statistics for the variables evaluated are shown in Table 1. The average petrol price (PPT) in Pakistan is 104.41, with the lowest being 75.35 and the highest being 117.59. Diesel has an average price of 104.52, with the lowest being 80.98 and the highest being 128.25. Similarly, the average LPG price is 1370, with the lowest price being 1051 and the highest being 1834. COVID-19 new cases, recoveries, and mortality have averaged 10848, 9937, and 221.48, respectively.

Table 2. Summary of ARDL model 1 for petrol price confirms and deaths of COVID-19

Coefficients	Estimate	std. error	t-value	p-value
Intercept	-9.552e-02	7.320e-01	-0.130	0.897224
COVCC	1.548e-03	3.963e-04	3.906	0.000631 ***
COVD	-4.229e-02	1.035e-02	-4.086	0.000397 ***
COVD.1	-4.513e-02	1.985e-02	-2.274	0.031838 *
PPT.1	-8.168e-01	1.337e-01	-6.112	2.18e-06 ***
PPT.2	-3.265e-01	1.338e-01	-2.440	0.022104 *

Residual standard error: 4.757 Multiple R-squared: 0.9078 Adjusted R-squared: 0.8451 F-statistic: 14.48,

P-value: 0.0000000593
**, ** and * represent 1%, 5% and 10% level of significance
COVCC (COVID confirm cases), COVD (COVID death) and PPT (the price of petrol).

Table 2 above shows the expected consequence of the petrol price and COVID-19. The COVID-19, as indicated by weekly confirmed cases and weekly mortality, is the dependent variable, while the price of gasoline is the independent variable. The weekly number of verified COVID-19 cases and weekly fatalities of COVID-19 patients are both negative and substantial, according to the data. Minor delays and variables are eliminated using p-values. The relationship between the price of petrol (PPT), the number of confirmed cases, the number of deaths, and the corresponding lags, the price of petrol at the first and second lags are negative and significant at 1% and 10%, respectively, and the coefficients of deaths cases at the present and initial lags are negative and significant. At the fourth lag, the number of confirmed cases is positive and considerable. The overall model is also significant. The fitted model is written as follows in (2) and represented in figure 1.

$$X_{t(ppt)} = -0.095 - 0.816x_{t-1} - 0.326x_{t-2} - 0.042d_t - 0.045d_{t-1} + 0.001c_t + \epsilon_i \quad (2)$$

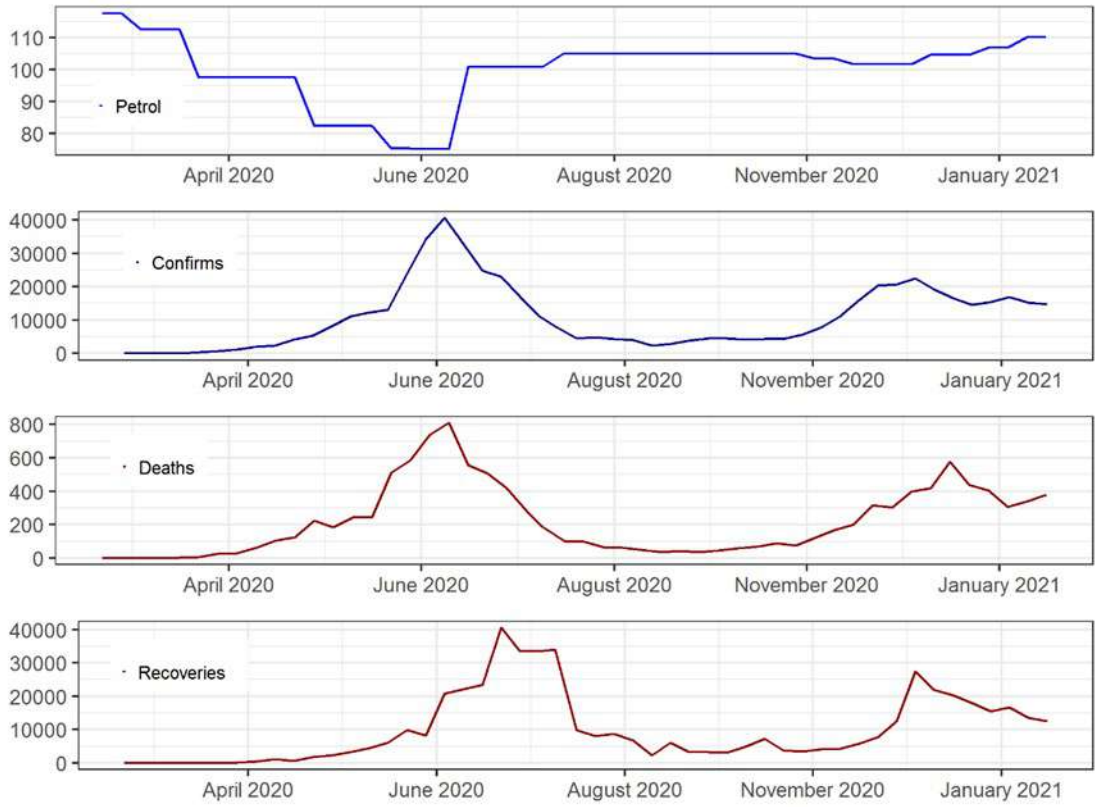

Figure 1. Price of petrol and COVID-19 Cases

Figure 1 illustrates four panels of gas prices and COVID-19 pandemic cases, which verifies fatalities and recoveries. The graph compares the number of new confirms, fatalities, and recoveries to the weekly variation in the price of gasoline. The graph depicts the fluctuation in the trend line for each element; the y-axis

on the left indicates the number of pandemic cases (confirmed, death, recovery), and the x-axis represents the monthly data from Feb 26, 2020 to Feb 25, 2021. The graph clearly shows this. The price of gasoline fell as the number of confirmed cases, fatalities, and recoveries from COVID-19 increased. In particular, in June 2020, a considerable increase was made in all three COVID-19-related instances, whereas the price of gasoline fell significantly over the same month. The trend line of petrol prices falling in June coincided with an increase in pandemic cases, with the greatest value of confirmation and mortality reported at the same time. Furthermore, the lowest reported gas price was 75 cents and the highest price was 117.59 cents, indicating a 57.7% swing throughout this time period. After June, the number of pandemic cases decreases, but the price of gasoline rises slightly in July before remaining constant until the end of the research.

3.3 ARDL Model Estimation for Price of Diesel and COVID-19

Table 3 shows the expected consequence of the fuel and COVID-19 prices. The fuel price is a dependent variable, while the COVID-19, as indicated by weekly confirmed cases and fatalities, is an independent variable. Based on p-values, slight lags and variables are excluded.

Table 3. Summary of ARDL for the Price of Diesel, Confirms and Deaths of COVID-19

Coefficients	Estimate	Std. Error	t value	p-value
Intercept	1.473e-02	1.174e+00	0.013	0.99009
COVCC	1.362e-03	6.519e-04	2.090	0.04698 *
COVD.t	-3.636e-02	1.571e-02	-2.315	0.02913 *
PD.1	-9.180e-01	1.561e-01	-5.881	3.89e-06 ***
PD.2	-4.376e-01	460e-01	-2.997	0.00608 **
*, ** and *** represent 10%, 5% and 1% level of significance Residual Standard Error: 7.647 Multiple R-squared: 0.814 Adjusted R-squared: 0.6875 F-Statistic: 6.435 P-value: 1.828e-05				

The table above depicts the link between the price of diesel, the number of confirmed cases, and the number of COVID-19 deaths. The coefficients related with the price of fuel at the first and second lags are negative and significant at the 1% and 5% levels of significance. Similarly, the response variable weekly the number of confirmed cases at the fourth lag is positive and significant at a 10% significance level. According to the number of fatality cases, the present value is negative and significant at a 5% significance level, and the entire model is significant. The models are chosen using adjusted R-square, and the recovered data is excluded since the p-value is not significant. The fitted model may be written as (3) and can be visualized as figure 2:

$$W_{t(pd)} = 0.01473 - 0.918w_{t-1} - 0.43w_{t-2} - 0.363d_t + 0.00136c_t + \epsilon_t \quad (3)$$

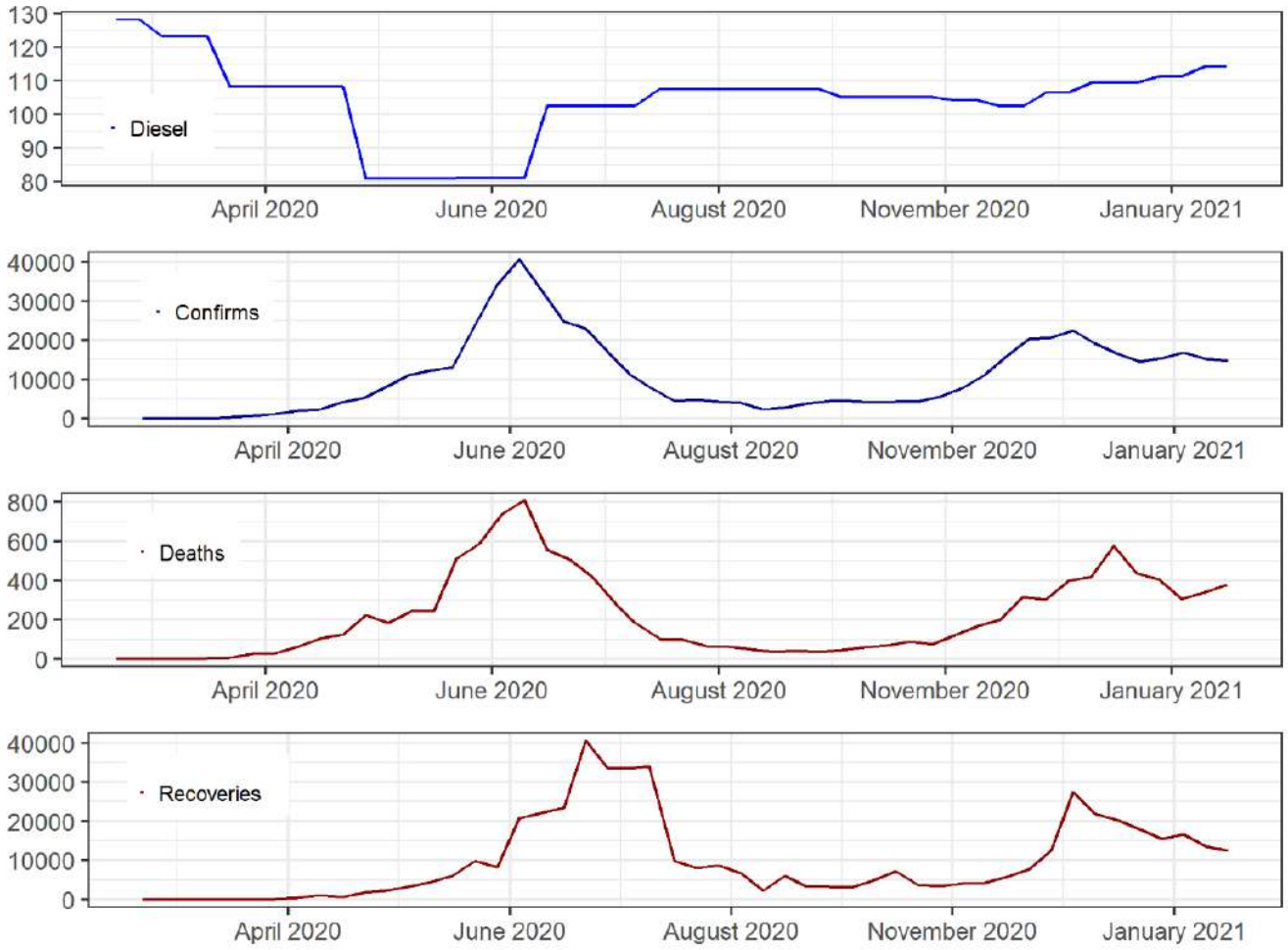

Figure 2. Price of diesel and COVID-19 Cases

Figure 2 depicts the prices of fuel and COVID-19 cases. The figure compares the number of new confirmed, mortality, and recovered cases to the change in fuel price. The figure displays fluctuations in the trend lines of each item; the y-axis on the left indicates the number of pandemic cases (confirmed, mortality, and recovery) and fuel price; the x-axis contains monthly data from Feb 26, 2020 to Feb 25, 2021. The price of diesel has dropped in response to an increase in the number of confirmed cases, fatalities, and recoveries caused by COVID-19. In particular, in June 2020, a considerable increase was made in all three COVID-19-related instances, whereas fuel prices fell significantly over the same month. The trend line of diesel price decreases in June, but pandemic cases increase at the same time, with the greatest value recorded of confirmation and mortality. Furthermore, the lowest reported price of petrol was 80.98, and the highest price was 128.25, indicating a 58.37% volatility throughout this time period. After June, pandemic instances drop, but fuel prices grow less in July. Following then, the price remains fixed until the research concludes.

3.4 ARDL Model Estimation for LPG Price and COVID-19

Table 4 shows the anticipated results of the pricing of LPG and COVID-19. The price of liquefied petroleum gas (LPG) is a dependent variable, whereas the COVID-19, as measured by weekly confirmed cases and mortality, is an independent variable.

Table 4. Summary of ARDL for the price of LPG COVID-19

Coefficients	Estimate	Std. Error	t value	p-value
Intercept	4.5228095	12.0763789	0.375	0.71118
COVCC.1	-0.0211399	0.0060276	-3.507	0.00173 **
COVCC.3	-0.0158627	0.0076684	-2.069	0.04908 *
COVD.3	0.7932920	0.3794380	2.091	0.04688 *
PLPG.1	-0.8703836	0.1515970	-5.741	5.55e-06 ***
PLPG.2	-0.6379633	0.1392225	-4.582	0.00011 ***
***', '**', '*' repesents Significance at 10%, 5% and 1% respectively.				
Residual standard error: 78.38				
Multiple R-squared: 0.8658 Adjusted R-squared: 0.7746				
F-statistic: 9.489 P-value: 4.689e-07				
Note: COVCC (COVID confirm cases), COVD (COVID death), PLPG (price of LPG)				

The table above depicts the link between the price of LPG, the number of confirmed cases, and the number of COVID-19 fatalities. According to the coefficients, the price of LPG at the first and second lags is extremely significant at the 1% level of significance. Similarly, the number of confirmed cases and number of fatalities are negative and significant at the 5% and 10% significance levels, respectively, during the first and third lags. The overall model is significant. The fitted model may be written as (4) and represented as figure 3.

$$Z_{t(plpg)} = 4.5228 - 0.8703z_{t-1} - 0.637z_{t-2} + 0.793d_{t-3} - 0.0211c_{t-1} - 0.0158c_{t-3} \quad (4)$$

Figure 3 displays the prices for liquefied petroleum gas (LPG) and COVID-19 situations. The graph compares the number of new confirmed, mortality, and recovery cases to variations in the price of LPG. The graph indicates that the trend line of each element fluctuates. The number of pandemic cases (confirmed, death, and recovery) and the LPG price are represented on the left y-axis, while the x-axis contains monthly data from Feb 26, 2020 to Feb 26, 2021. The price of LPG has decreased as the number of confirmed cases, fatalities, and recoveries as a result of COVID-19 has increased. In particular, in June 2020, a considerable increase was made in all three COVID-19-related instances, whereas the price of LPG decreased significantly over the same month.

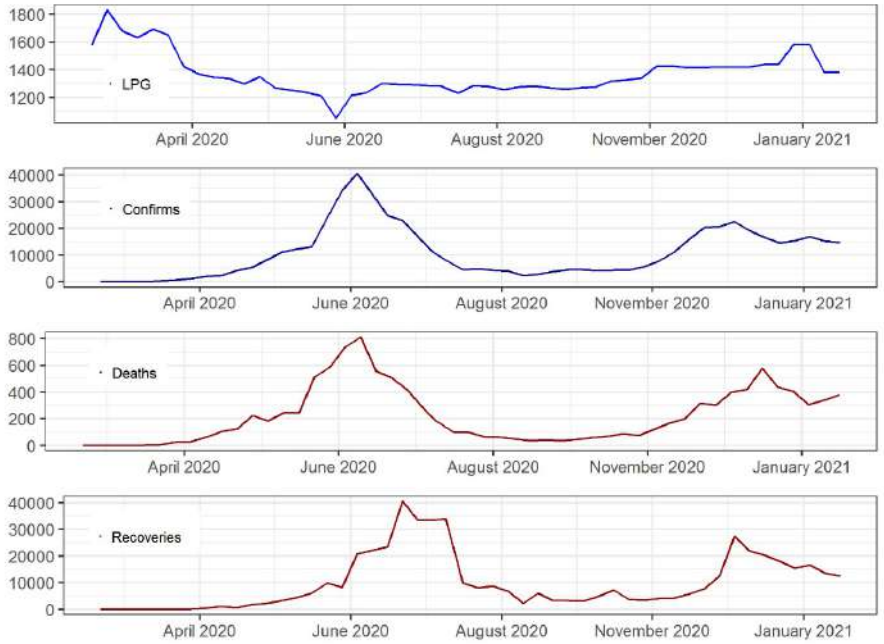

Figure 3. LPG Prices and COVID-19

4 Results

4.1 Qualty Control Tests and Analysis

The CUSUM and CUSUMSQ tests for gasoline shown in figure 4 demonstrate that the ARDL model is stable, validating the stability of our findings.

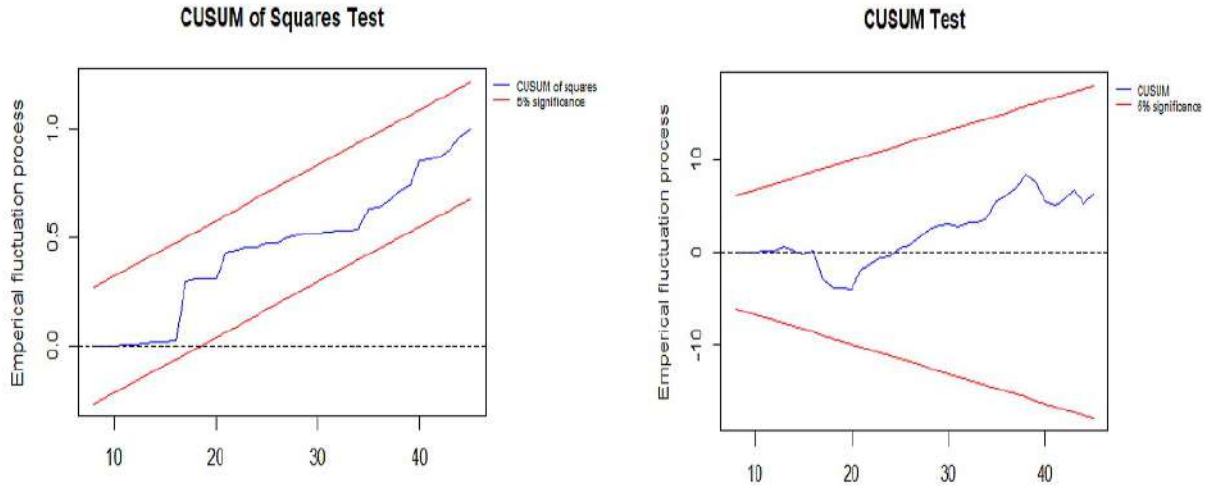

Figure 4CUSUM and CUSUMSQ Tests For Gasoline

Figure 4. CUSUM and CUSUMSQ Tests For Gasoline

4.2 Bound Test Result

We used the bound test to analyze the long-run connection between commodity prices and COVID-19. The I (I) series has an upper bound, while the I (0) series has a lower bound. The research [35] yields the critical value for this series. If the critical value of the upper limit is less than the F-statistics value, it indicates the existence of a long-run relationship.

Table 5. Bond Test Results for Petroleum

Model1 (PPT)	Lower bound I (0)	Upper bound I(I)	F-statistics	Conclusion
1%	4.188	5.328		
5%	3.048	4.002	14.948	Cointegration
10%	2.538	3.398		
Mode2 (PD)				
1%	4.188	5.328		
5%	3.048	4.002	11.913	Cointegration
10%	2.538	3.398		
Mode3(PLPG)				
1%	4.188	5.328		
5%	3.048	4.002	9.185	Cointegration
10%	2.538	3.398		
Note:(a) critical value at 1%,5% and 10% significance level. (b) PPT=price of petrol, PD=price of Diesel, PLPG= price of LPG (gas)				

4.3 Autoregressive Distributed Lag Model Analysis

The ARDL estimate result for the model is shown in table 6 as under. According to Model 1, the price of gasoline (PPT) is a dependent variable, whereas COVID, confirmed cases, mortality, and the number of recoveries are independent factors. The independent variable coefficient COVID mortality cases have a negative and substantial long-run association, which indicates that as the death toll grows, so does the price of gasoline. Confirming and recovering cases, on the other hand, have a favorable and significant influence on the long-term connection. Model 2 demonstrates that the price of diesel is a response variable, whereas confirm cases, mortality, and recoveries are endogenous variables. The confirming and fatality occurrences coefficient has a negative and severe influence on the long-run relationship. This indicates that confirmed instances and deaths are on the rise. Similarly, diesel prices are falling. Model 3 shows LPG price as a dependent variable, and COVID-19 as an explanatory variables; the coefficient of confirmed cases and recovered cases has a negative and substantial influence on the long-run relationship.

In the above table, model one reveals that COVID-19 mortality seemed to have a significant negative relationship with the price of fuel in the future, with an increase in mortalities decreasing the gasoline price. In model 2, COVID-19 confirms that cases and mortality instances have negative relationships with the fuel price. implying that an increase in COVID-19 cases can lower the price of petrol. Similarly, model

Table 6. The Long-Run Coefficients

Model 1 PPT with COVID	**Coefficient**
PPT (price of petrol)	-3.7477
COVCC (confirm cases)	0.0016***
COVD (death)	-0.131*
COVR(recovery)	0.0003**
Model 2 PD with COVID	**Coefficient**
PD (price of diesel)	-4.774
COVCC (confirm cases)	-0.0002**
COVD (death)	-0.16 *
COVR(recovery)	0.001 ***
Model 3 PLPG with COVID	**Coefficient**
PLPG (the price of LPG)	-3.34
COVCC (confirm cases)	-0.03**
COVD (death)	1.17
COVR(recovery)	-0.001***
Note: ***, **, * indicates significance level at 1%, 5% and 10% level respectively.	

3 has the same as model 1.

In this study, we predicted up to ten weeks for diesel, LPG, and gasoline, which are denoted as (a), (b), and (c) respectively.

5 Discussion and conclusions

The COVID-19 epidemics have caused havoc throughout the world. It has spread the influence of oil price variations on the country's economy across all areas, including the economy, education, commerce, health, commodity pricing, and other smaller sectors. The influence of COVID-19 on petrol, diesel, and liquefied petroleum gas (LPG) prices in Pakistan is examined in this paper. From Feb 26, 2020 to Feb 25 2021, the study looked at weekly data on COVID-19 (Confirms, Recovery, and Mortality cases) and petrol, diesel, and LPG prices. We employed time-series data analysis and statistical modeling to supplement dicky-fuller. The Bound test is used for short-term and long-term relationships, whereas the Test is used for stationarity and the Autoregressive distributed lag (ARDL) model. The ARDL model results reveal that the COVID-19 (confirms deaths cases) has a negative and significant influence on the pricing of gasoline, diesel, and LPG

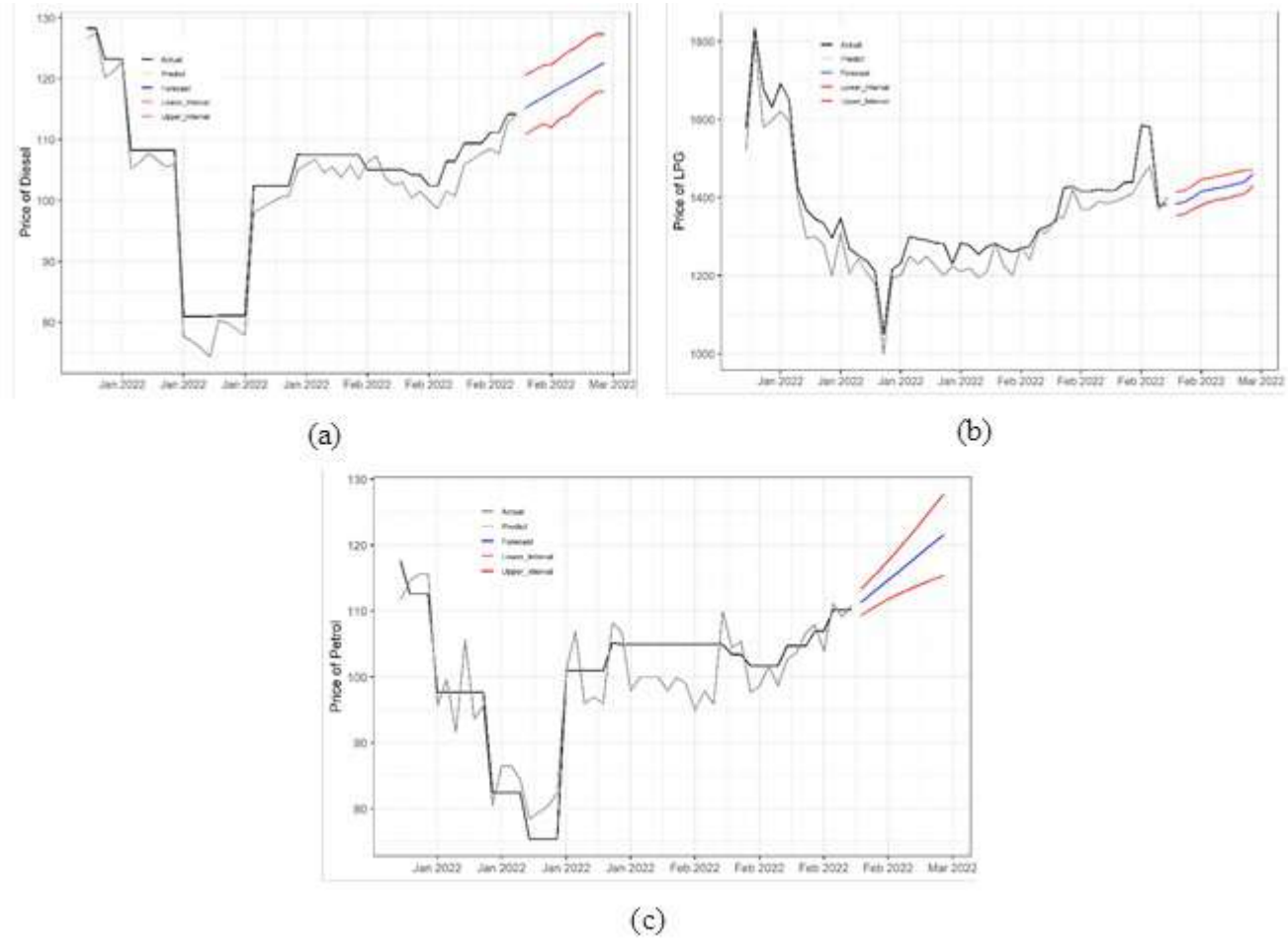

Figure 5. Ten weeks Forecasting the Prices of (a) Diesel (b) LPG, and (c) Petrol.

Author Contributions

Muhammad Naeem and Muhammad Bilal: Conceptualization, Methodology, Software. **Maqbool Ahmed and Noor Mahmood**: Data curation, Writing- Original draft preparation. **Muhammad Aamir and Shakoor Muhammad**: Visualization, Investigation. **Umair Khalil**: Supervision. **Muhammad Bilal and Nida Khalid**: Software, Validation. **Saleem Abdullah and Laiba Sultan Dar**: Writing- Reviewing and Editing

Compliance with Ethical Standards

It is declare that all authors don't have any conflict of interest. It is also declare that this article does not contain any studies with human participants or animals performed by any of the authors. Furthermore, informed consent was obtained from all individual participants included in the study.

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