COVID-19, Government Initiatives, and Stock Market Liquidity in Pakistan

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ABSTRACT

This study focuses on two proxies of COVID-19 and its impact on Pakistan and government initiatives' stock market liquidity and the human cost by exploring the rate of spread of COVID-19 infections. Using time-series data of the Pakistan Stock Exchange from January 2, 2020 to November 30, 2020, our finding suggests that a decreasing (increasing) trend in the confirmed COVID-19 cases is associated with improving (deteriorating) liquidity of Pakistan's stock market. This study concludes that policy interventions are related to stock market liquidity. Results reveal that government initiatives' control over COVID-19 cases reduces the uncertainty among the market and investors.

Keywords: COVID-19, Stock Market liquidity, Stringency Index, Confirmed Cases, Death Cases.

INTRODUCTION

The Coronavirus, known as COVID-19, is considered a shock for developed, emerging and developing economies (Hevia & Neumeyer, 2020). COVID-19 affected the economies and social life, the way of living and discourse in media and society. Government policies and initiatives are vital for success by utilizing the health official to tackle this novel disease. Media and social media gave COVID-19 a trend to make people aware by explaining causes, remedies and implications (Rhodes et al., 2020). An increase in COVID-19 cases and deaths significantly increases the market's illiquidity and volatility (Baig et al., 2021). To control the progressive or exponential growth of COVID-19 contagions, governments have instituted boundaries (bans) on doing business and movement around the globe. In Pakistan, a smart-lockdown policy has been introduced and recognized because of its effectiveness in controlling COVID-19 cases.

Financial analysts reported capital outflows, strictness in financing conditions and emerging recession symptoms, especially in emerging or developing economies. These constraints also restrict policymakers from providing bailout packages to trades that hinder stock markets' liquidity. It is pretty tricky for policymakers to decrease the spread of infectious diseases and ensure Pakistan's economic stability. This epidemic condition necessitates the widespread practice of long-term portfolio balancing to guarantee liquidity (Chakrabarti, 2021; Corbet et al., 2022).. In contrast, an increase in the number of days of lockdown, monetary policy decisions, and travel restrictions severely affect economic activities and opening and closing stock indices prices (Ozili & Arun, 2020). Such kinds of issues have increased significance for emerging economies and markets (Deloitte, 2020). The COVID-19 crisis impacted the French economic system's overall efficiency and made the market less efficient than at normal times (Guerini et al., 2020). COVID-19 induced extraordinary uncertainty in the financial markets (Baker et al., 2020; Narayan, 2020a) and caused significant shifts in fundamental demand patterns and business production, resources, and practices (Barrero et al., 2020). Foreign and traditional ownership have inverse relationships with abnormal returns, i.e., negative and positive returns due to the COVID-19 crisis (Takahashi & Yamada, 2021). Due to this situation, liquidity is draining from the financial markets (Adrian & Natalucci, 2020; Wilkes, 2020). Due to such uncertainty and risk, transaction cost and other cost factors lead to increased spreads that significantly damage the liquidity of the financial markets.

At the time of economic and financial crises, fading financial and market liquidity highlights each other's decline (Geanakoplos, 2010). These issues problematize the liquidity aspect and compel the market and economy to shrink, which ultimately causes an overall economic slowdown (Næs et al., 2011). Stock market liquidity has also been suggested as an alarm for the economies' economic situation. Researchers' prevalent discourses in the context of COVID-19 and stock market volatility and risk signify the topic and way of knowledge accumulation by spotting a proper gap in the literature. This study contributes to the existing literature by examining whether the pandemic and government initiatives to avoid people moving can improve the stock market liquidity in the equity market of Pakistan's emerging economy. This study focuses on two perspectives of COVID-19 and its impact on the stock market of Pakistan. The first perspective is about human costs by exploring the COVID-19 spread rate and its contagion effect. The second perspective is government initiatives from the general public, such as social

distancing by closing education institutions, limiting businesses, halting the county's transportation mechanism, smart lockdowns in the infectious areas, and public awareness campaigns. We found that the decrease or increase in the number of confirmed COVID-19 cases is related to improving or waning liquidity in Pakistan's emerging economy's financial markets. This study also found that government restrictions and banned movement and business initiatives improve stock market liquidity. Trust in the government's policies and initiatives may enhance investors' trust, bringing more confidence in trading on the stock markets (Chiu, 2019).

Many countries like Pakistan provided bailout packages or incentives in the process of such policies by reducing taxes, rebates on electricity and gas bills and loans at low rates to pay salaries to the employees. The government provides funding and employment opportunities in the country that improve stock market liquidity indirectly (IMF, 2020). The risk of economic uncertainty explaining illiquidity in the financial market is higher for emerging markets like Pakistan because of strict restrictions on policymakers' fiscal and monetary freedom, making investors unable to reinstate their portfolios rapidly and increasing the asymmetry of information (Chowdhury et al., 2018). As the Pakistan stock market is considered better and rated as a better market, this study used counties on a justified basis. Pricing based on liquidity risk depends on economics, geography, government policy or political factors (Lee, 2011). The most important one is government policy. Therefore, in this study, the focus will be on government policies to deal with COVID-19 and its other interventions to smooth the stock market behaviour in terms of liquidity, volatility and investor behaviours. This study examines the relationship between COVID-19-related initiatives and their impact on stock market liquidity. This study explores whether COVID-19 confirmed cases and deaths using a flattening curve have any financial or economic impact on the Pakistan stock market by liquidity (Haroon et al., 2020b).

This study used changes or moving averages of confirmed COVID-19 patients or death; an upward direction reveals positive change, a downward direction shows negative change, while a flat curve means no change. The finding demonstrates that the upward direction of COVID-19 and stock market lucidity is directly related, whereas the downward direction is inversely associated with stock market liquidity. Forecasting in such crises as COVID-19 is more difficult than expected, and real economic impact depends on investor behaviours rather than fundamentals (Boscaljon & Clark, 2013). It demonstrates that governmental interventions and initiatives did help to ease the insecurity of investors. We reached a point where government initiatives are essential for health systems to tackle COVID-19 resourcefully, enhance investors' trust, and mitigate the insecurity in the stock market during such a volatile time in Pakistan.

DATA AND METHODOLOGY

COVID-19 data availability is limited because the first confirmed case was reported in December worldwide and in March 2020 in Pakistan. Meanwhile, we have utilized pandemic data from January 2, 2020 till November 30, 2020, which has witnessed the rise and fall of the COVID-19 pandemic in this period according to the National Command and Operation Centre (NCOC) and World Health Organization (WHO). We focused on the Stock Market liquidity and the effect of

the COVID-19 pandemic, and Government action. We picked the data from the official website of the Stock Exchange of Pakistan (KSE-100) for a specified period to analyze the consequences of the COVID-19 pandemic. Overall, the whole world's economies are detracted and still not recovered due to it, identical to Pakistan but recovered speedily because of government action taken timely.

I used the KSE-100 Index to ensure standardization for calculation and analysis of data from the start of COVID-19 until its second wave. This study used daily return by this equation

$$KSE\_rt = \ln(LPt) - \ln(LPt-1) \quad \text{(i)}$$

Here KSE_rt represents the daily return of a stock. LPt represents the lower price of the stock at the current period as it is time-series data, and LPt-1 represents the lower price of the previous period. Related daily data of the KSE-100 is collected for liquidity measures summarized in Table1. The exponential generalized autoregressive conditional heteroskedasticity (EGARCH) model is used to measure the volatility that is a favourite methodology of volatility researchers in the existing literature. Yu & Hassan (2008) and Rizvi et al. (2018) applied the GARCH model, which is developed by Nelson (1991). The author suggested a robust EGARCH that is more appealing because of parameters constraints and a stable optimization approach.

Table 1. Variable Description

Liquidity	is quantified by the difference between low and high relative to the index's opening price. A high value means liquidity
Volatility	EGARCH used to calculate volatility parameter used in the study
Stringency	index is an index used by the Oxford on COVID-19 pandemic Government Response tracker
COVID-19_Cases	The Government of Pakistan reports the COVID-19 daily cases. As it reduces and approaches zero, then the results will become flattens
COVID-19_Death	The daily COVID-19 Deaths are reported by the Government of Pakistan. A value nears zero means the curve becomes flat

To better understand the impact of COVID-19 cases and death cases, daily change is calculated by the 7-day moving average (MA) of new cases or deaths, respectively, which Pakistan officially announces. To properly understand the relationship between the cases and deaths with the market's liquidity, we use time-series data. The inquiry is controlled for market volatility and stringency of lockdown measures in Pakistan. The model used in this article is as follows: Liq represents the liquidity in the financial market; Krvol is the GARCH Volatility; SI is Stringency Index; Case for the Cases reported by the Government and Death for the Deaths due to COVID-19 reported by the government.

$$Liq_t = \alpha + \beta_{1Krvolt} + \beta_{2SIt} + \beta_{3Caset} + \varepsilon \quad \text{(ii)}$$

$$Liq_t = \alpha + \beta_{1Krvolt} + \beta_{2SIt} + \beta_{3Deatht} + \varepsilon \quad \text{(iii)}$$

EMPIRICAL ANALYSIS

Descriptive statistics for liquidity, stringency, confirmed cases, and death cases of COVID-19 are review as total observations, which means the number of days taken for the analysis about the impact of COVID-19 on stock market liquidity is 222 (from the first case of COVID-19 and before starting the second wave). In this period, Stock market liquidity varies from a minimum value of 0.41 to a maximum value of 7.03, which shows a significant difference in its values. This significant difference is the impact of confirmed cases and the deaths of people in the country. The government took initiatives to control the COVID-19 cases by taking different measures to improve the country's financial conditions and move the stock market towards improvement, stability, and confidence-building of investors towards investment. The summary of different descriptive measures is given below in Table 2, which depicts stock market liquidity.

Table 1. Variable Description

Variables	Observations	Mean	S.D	Min	Max
Liquidity	222	1.779	1.26	0.41	7.03
Stringency	222	53.26	28.272	0	96.3
Confirmed	222	160097.6	144804.5	0	400482
Deaths	222	3321.95	3004.13	0	8091

After analyzing the descriptive statistics, inferential statistics analysis is elaborated to understand time-series data properly. We have used two different models to explore the impact of COVID-19 and government initiatives on Pakistan's stock market liquidity. Table 3 presents the results from which exciting conclusions can be drawn. The COVID-19 cases depicted below are calculated as the percentage change of seven days moving average of Confirmed COVID-19 cases reported by NCOC. As the COVID-19 cases increases, it significantly affects the stock market's liquidity, which shows uncertain macroeconomic conditions and investment climate uncertainty in Pakistan. However, Figure 1 of Liquidity, Confirmed Cases and Deaths show that as and when time passed, the deaths from corona increase with the increase in corona cases significantly affect the liquidity.

Table 3. Regression results

Item	Model 1	Model 2
Volatility	0.00**	0.00**
	(4.20)	(4.19)
Stringency Index	0.04*	0.04*
	(2.10)	(2.10)
COVID-19_Cases	0.00**	
	(-3.60)	
COVID-10_Death Cases		0.00**
		(-3.63)
Constant	0.00**	0.00**
	(5.00)	(5.10)

"The results for time series effect robust estimations for the two models with the stock market's liquidity as the dependent variable. t statistics are given in parenthesis. The superscripts * and ** shows significance at 5% & 10% respectively"

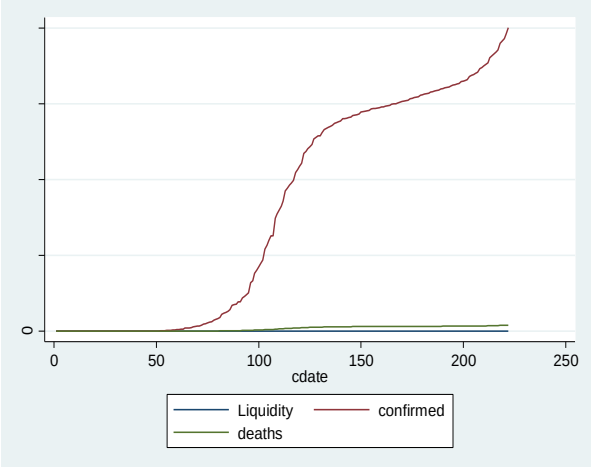

Figure 1. COVID-19 Cases, death cases and liquidity

Meanwhile, an increase in stringency tends to balance or stabilize the liquidity situation in Pakistan's stock market, as per in Table 3. The stringency index, as explained in table1, shows the government responses across the country in dealing with the COVID-19 pandemic. As per Battalio and Schultz (2011), it shows light on the regulatory certainty that improves the stock market's liquidity, but spreads tend to reduce. This situation damages the confidence of investors in regulatory bodies being proactive and deviate from the precise direction. As per Carruthers and Stinchcombe (1999), society's social structure, the corollary of legal structures and signals, tends to raise investor confidence and increase the stock market liquidity in bullish or bearish markets. Finally, the two models' results show significance at 1% and 5% level of significance about stock market liquidity as the dependent variable associated with stringency index and COVID-19 confirmed cases and death cases. For the Breusch-Godfrey LM test, autocorrelation results in both models of confirmed cases and death cases, which shows the significant results ($p=0.00$) at the degree of freedom 1.

CONCLUSION

Unfortunately, the world is facing unprecedented social and economic problems caused by the COVID-19 pandemic. Financial markets around the world, especially in Pakistan, have been severely affected. However, due to the general public's pandemic awareness about its various measures to control and curb infectious diseases. Government initiatives and slowdowns COVID spread play an essential role in Pakistan and gained international fame by introducing a smart lockdown. We also examine whether such understanding describes the ease of volatile Pakistan's financial markets in this uncertain time. We find a decrease (increase) in the number of COVID-19 cases and deaths generally associated with improving or deteriorating liquidity in Pakistan's stock market. We also find that government policies to curb gatherings and people's movement helped improve the financial market's liquidity. Amidst COVID-19, when uncertainty was increasing among investors, our results suddenly became insignificant. However, they improved slowly after government interventions by giving reliefs, concessions, and accessible loan facilities to the general public and businesses.

The findings show a decrease in the number of COVID-19 cases and deaths, a sign of relief, and a decrease in uncertainty and insecurity, whereas enhanced liquidity in Pakistan's stock market. As more data streams were included on the COVID-19 pandemic from the second wave, the results can be expanded by adding data on Pakistan's stock market to understand its unique characteristics.

REFERENCES

Hevia, C., & Neumeyer, P. A. (2020). A perfect storm: COVID-19 in emerging economies. *COVID-19 in developing economies*, *1*(1), 25-37.

Rhodes, J. M., Subramanian, S., Laird, E., & Kenny, R. A. (2020). low population mortality from COVID-19 in countries south of latitude 35 degrees North supports vitamin D as a factor determining severity. *Alimentary pharmacology & therapeutics*, *51*(12), 1434.

Baig, A. S., Butt, H. A., Haroon, O., & Rizvi, S. A. R. (2021). Deaths, panic, lockdowns and US equity markets: The case of COVID-19 pandemic. *Finance research letters*, *38*, 101701.

Corbet, S., Hou, Y. G., Hu, Y., Larkin, C., Lucey, B., & Oxley, L. (2022). Cryptocurrency liquidity and volatility interrelationships during the COVID-19 pandemic. *Finance Research Letters*, *45*, 102137.

Chakrabarti, P. (2021). Co-movement of volatility risk premium: evidence from single stock options market in India. *Applied Economics Letters*, *28*(14), 1181-1186.

Ozili, P. K., & Arun, T. (2020). Economic Effects of Coronavirus Outbreak.

Guerini, M., Nesta, L., Ragot, X., & Schiavo, S. (2020). Firm liquidity and solvency under the Covid-19 lockdown in France. *OFCE policy brief*, *76*, 1-20.

Deloitte. 2020, March. Flattening the curve Impact on the Indian banking and capital market industry. Accessed May 4, 2020. https://www2.deloitte.com/content/dam/Deloitte/in/ Documents/financial-services/in-fs-flattening-the-curve-impact-on-the-indian-bankingand-capital-markets-noexp.pdf

Haroon, O., & Rizvi, S. A. R. (2020). Flatten the curve and stock market liquidity–an inquiry into emerging economies. *Emerging Markets Finance and Trade*, *56*(10), 2151-2161.

Baker, S. R., N. Bloom, S. J. Davis, and S. J. Terry. 2020. COVID-induced economic uncertainty. No. w26983. USA: National Bureau of Economic Research.

Barrero, J. M., N. Bloom, and S. J. Davis. 2020. COVID-19 is also a reallocation shock No. w27137. USA: National Bureau of Economic Research

Narayan, P. K. 2020. Oil price news and COVID-19—Is there any connection? Energy Research Letters 1 (1):13176. doi:10.46557/001c.13176

Takahashi, H., & Yamada, K. (2021). When the Japanese stock market meets COVID-19: Impact of ownership, China and US exposure, and ESG channels. *International Review of Financial Analysis*, *74*, 101670.

Adrian, T., and F. Natalucci. 2020. COVID-19 crisis poses threat to financial stability. Accessed May 4, 2020. https://blogs.imf.org/2020/04/14/COVID-19-crisis-poses-threat-to-financialstability/.

Wilkes, T. 2020. The plumbing behind world's financial markets is creaking. Loudly. Accessed March 15. https://www.reuters.com/article/us-health-coronavirus-markets-crisis-ana/theplumbing-behind-worlds-financial-markets-is-creaking-loudly-idUSKBN2120NJ.

Geanakoplos, J. 2010. The leverage cycle. NBER Macroeconomics Annual 24 (1):1–66. doi:10.1086/648285.

Næs, R., J. A. Skjeltorp, and B. A. Ødegaard. 2011. Stock market liquidity and the business cycle. The Journal of Finance 66 (1):139–76. doi:10.1111/j.1540-6261.2010.01628.x.

Chiu, Y. C. 2019. Macroeconomic uncertainty, information competition, and liquidity. Finance Research Letters. doi:10.1016/j.frl.2019.08.010.

IMF. 2020. Policy responses to COVID-19. Accessed May 4, 2020. https://www.imf.org/en/ Topics/imf-and-COVID19/Policy-Responses-to-COVID-19.

Chowdhury, A., M. Uddin, and K. Anderson. 2018. Liquidity and macroeconomic management in emerging markets. Emerging Markets Review 34:1–24. doi:10.1016/j. ememar.2017.10.001.

Lee, K. H. 2011. The world price of liquidity risk. Journal of Financial Economics 99 (1):136–61. doi:10.1016/j.jfineco.2010.08.003.

Haroon, S., Chandan, J. S., Middleton, J., & Cheng, K. K. (2020). Covid-19: breaking the chain of household transmission. *Bmj*, *370*.

Boscaljon, B., and J. Clark. 2013. Do large shocks in VIX signal a flight-to-safety in the gold market? Journal of Applied Finance 23 (2):120.

Yu, J. S., & Hassan, M. K. (2008). Global and regional integration of the Middle East and North African (MENA) stock markets. *The Quarterly Review of Economics and Finance*, *48*(3), 482-504.

Rizvi, S. A. R., Arshad, S., & Alam, N. (2018). A tripartite inquiry into volatility-efficiency-integration nexus-case of emerging markets. *Emerging Markets Review*, *34*, 143-161.

Nelson, D. B. (1991). Conditional heteroskedasticity in asset returns: A new approach. *Econometrica: Journal of the econometric society*, 347-370.
Battalio, R., & Schultz, P. (2011). Regulatory uncertainty and market liquidity: The 2008 short sale ban's impact on equity option markets. *The Journal of Finance*, *66*(6), 2013-2053.
Carruthers, B. G., & Stinchcombe, A. L. (1999). The social structure of liquidity: Flexibility, markets, and states. *Theory and society*, *28*(3), 353-382.