P-ISSN: 2709-6254	Journal of Development and Social Sciences	Oct-Dec 2022, Vol. 3, No. 4
O-ISSN:2709-6262	http://dx.doi.org/10.47205/jdss.2022(3-IV)33	[339-344]

Journal of Development and Social Sciences
www.jdss.org.pk

RESEARCH PAPER

Covid-19 Uncertainty Impact on Exchange Rate: The Case of Pakistan

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ABSTRACT

This study has explored the link between Covid-19 uncertainty and the exchange rate of the dollar in terms of Pakistani rupees. High-frequency daily data has been taken from 31 December 2019 to 28 April 2021 to evaluate the relationship between these two variables. Covid-19 has affected the badly international market price but it is less explored in the Pakistani market regarding exchange rate volatility. The VAR model has been applied to explore the link. VAR model is used because in the VAR model all variables are endogenous. The results of the model demonstrate that Covid-19 uncertainty affected the exchange rate of Pakistan in the first lag but insignificant impact in the second lag. When Covid-19 uncertainty increases, demand for the dollar also increases, as the dollar is a stable currency; therefore, the exchange rate of the dollar in terms of rupees increases. Government policy announcements can reduce this Covid-19 uncertainty.

KEYWORDS Covid-19, Exchange Rate Volatility, Pakistan, Uncertainty Index

Introduction

Economic policy uncertainty got important in the era of Keynes (1937) and, it`s explained the fluctuations in economic activities. The appearance of Covid-19 on 31st December 2019 in China is considered a great uncertain situation for economic activities due to a lot of news spread, restrictions, and changes in policy announcements; therefore, this global pandemic attracted the attention of international economists (Özçatalbaş, 2020; Liu et al., 2020; Spiteri et al., 2020).

During the outbreak of Covid-19, prices have fluctuated rapidly in the financial markets and, volatility and uncertainty have increased with it. The economic impact of this human tragedy is still a mystery that is being solved by many economists to give proper economic policy (Lombardi et al., 2021). The economic impact of Covid-19 can be analyzed if we measure that how much uncertainty is created by it. Baker et al (2020) discovered that uncertainty in the Covid- 19 is greater than uncertainty during the recession of 2008.

Uncertainty is the main factor of economic sluggishness, as with it my companies wait to have a clear economic outlook for their investments and, uncertainty does not only hit an economic recession but also affects the transmission mechanism.(Aimer, 2016, 2017) There are two types of uncertainties, One is economic policy uncertainty and, the other is unobserved uncertainty. Economic policy uncertainty has a negative relation to income, consumption, and employment; on the other hand, due to bumping in the uncertainty index decreases the tourism demand in various countries(Işık et al., 2020; Payne et al, 2021; Günay et al., 2020). Economic policy uncertainty escalated after the financial crisis of 2007- 08, as global markets are more exposed to adjustments in monetary policy, and tax trade policy; therefore, with these changes exchange rate becomes more volatile (Longstaff et al, 2011).

On the other side the storyline, the exchange rate fluctuates with unobserved uncertainty and, this theory is called "scapegoat theory" which was presented by Bacchetta and Van Winscoop (2004, 2013). In their theory, the exchange rate can be volatile due to unobserved uncertainty instead of observed macroeconomic policy uncertainty(Bacchetta and Van Winscoop, 2013).

Various studies have analyzed the relationship between exchange rate fluctuation and uncertainty but there are fewer number studies with high-frequency data, especially daily data. Some researchers have demonstrated that the inclusion of high-frequency data can improve prediction accuracy (Zhang and Wang, 2019). Moreover, the measurement of the uncertainty index is also a problem; therefore, it should be comprehensive. This study has used high-frequency daily data and, using the new uncertainty index of Covid-19 by Narayan, Iyke, and Sharma (2021) which is developed differently from covid-19-related articles of the 45 most famous worldwide newspapers and, utilized 327 keywords.

Literature Review

Numerous studies explored the link between exchange rate volatility and economic policy uncertainty but the results are not clearly defined. As Bush and Noria (2021) found out the volatility of the peso exchange rate in Mexico decreased during the time of 1999-2018 due to remedy for domestic, political, and international uncertainty. On the other hand, another measure of uncertainty is "Knightian uncertainty" which enhances the fluctuation of the exchange rate. Moreover, their study found that during the downfall of the economy, the effect of international and domestic uncertainty is amplified.

The covid-19 pandemic has elaborated political and regulatory uncertainty (Hitt et al, 2021; Sharif et al., 2020, Padhan & Prabheesh, 2021). On the other side, the increment in infected people and, the death announcement has amplified the economic policy uncertainty index (Albulescu, 2020). The positive link between economic policy uncertainty and exchange rate volatility is described by Krol (2014). Mostly, economic policy uncertainty affects macro and financial indicators and, an excessive level of uncertainty might cause an economic downturn; moreover, various researchers explored the relationship between exchange rate volatility and international uncertainty(Grossmann et al., 2014; Aimer, 2021; Chen et al., 2020).

Naqvi (2021) created an economic policy uncertainty index with three leading newspapers in Pakistan. This index captured the different indices for instance terror activities, floods, political uncertainty, IMF restraints, and the recent COVID-19 pandemic. The exchange rate volatility of the US dollar in rupees is explored with uncertainty index movement. The paper results described that market economic policy uncertainty is invalid in the down phase of the economy about a dollar to exchange rate fluctuations whereas general uncertainty becomes significant in this situation while the negative growth rate of income accelerates exchange rate volatility.

The scapegoat theory described the relationship between the unobserved uncertainty and volatility of the exchange rate. According to it when uncertainty increases in the economy the economic agents find some reasons to define the movement in the exchange rate whereas it is insignificant to their previous structural relationship (Fratzscher et al., 2015); therefore, economic agents give more weight to observing variable uncertainty instead of unobserved variables in describing the dynamics of the exchange rate. Subsequently, unobserved factors are overlooked in this link(Bacchetta and Winscoop, 2013; Pozzi and Sadaba, 2018). Fratzscher et al. (2015) introduced unobserved factors into macroeconomic models of exchange rate and, it is an important factor to describe the short-run dynamics and, gives a reason for the weak link between exchange rate and economic indicators. This study has checked the link between exchange rate volatility and covid-19 uncertainty with the VAR model

Material and Methods

The study has chosen two variables the exchange rate of Pakistani rupees in terms of the dollar and the Covid-19 uncertainty index developed by Naryan, Iyke, and Sharam (2021). There are two reasons for choosing this index, First reason is it is daily data and the other is, that this index is constructed internationally with 45 worldwide newspapers and 327 keywords that are related to Covid-19. The daily data has been taken off the exchange rate of rupees in terms of the dollar and Covid-19 uncertainty indices from 31 December 2019 to 28 April 2021. This study will check the fluctuation in the exchange rate of Pakistan in the context of Covid-19 and Covid-19 Uncertainty indices

The VAR technique is used to explore the relationship between Covid-19 uncertainty and exchange rate volatility. The VAR technique is used by Sim (1980) Sim et al, (1990) in their paper to check the dynamic behavior of random disturbance regarding variables with the equation. In the VAR model, all the variables are considered endogenous variables, and, their lag values are also taken into the equation. Therefore, lag length selection is important in the VAR model. It can be selected with the Akaike information criteria (AIC), the Schwartz information criteria (SIC), and the likelihood ratio (LR) test.

Results and Discussion

The equation of the VAR model is run step by step. Firstly run the unit root test to check the stationary of variables. All the variables are stationary at the first difference.

Unit Root Test

Table 1
Unit Root Test

Variables	Dickey-Fuller Test		Phillips-Perron test	
	Level	1st difference	Level	1st difference
Covid-19 Uncertainty index	0.000	0.0000	0.000	0.0000
Exchange rate	0.5660	0.0000	0.5807	0.0000

Lag Length Selection

Table2
Lag Length Selection

Lags	AIC	HQI	SBIC
0	9.76948	9.77838	9.79181
1	9.47513	9.50181	9.54212
2	9.39032*	9.43479*	9.50197*

As the lag length criteria are important in VAR for correct specification; therefore, according to AIC, HQI and SBIC 2 lags are appropriate lags.

VAR Model

Table 3
Results of VAR model

Variables	Coefficient	Standard Error	P-Value
Exchange Rate			
Exchange Rate Lag(1)	-0.1248879	0.0527515	0.018
Lag(2)	0.2135227	0.0535121	0.000
Covid-19 Uncertainty Lag(1)	-0.0088751	0.0044043	0.044

Lag(2)	-0.0008394	0.0043446	0.847
Constant	-0.0010538	0.0390924	0.978
Covid-19 Uncertainty			
Exchange Rate Lag(1)	2.030736	0.6250216	0.001
Lag(2)	-0.0771234	0.6340337	0.903
Covid-19 Uncertainty Lag(1)	-0.5767081	0.0521841	0.000
Lag(2)	-0.2422111	0.0514763	0.000
Constant	0.0734284	0.4631823	0.874

The following results of the VAR model describe that Covid-19 uncertainty affects the exchange rate positively at the first lag, on the other hand in the second lag, the sign is still positive but the coefficient is insignificant. Exchange rates also affect its values negatively at the first and the positively at second lag length. These results prove the scapegoat theory by Fratzscher et al., (2015) that uncertainty increases the volatility of the exchange rate. It is a positive link because whenever covid-19 uncertainty increases, the demand for the dollar increases as a dollar is a stable money; therefore, the exchange rate of the dollar in terms of rupees increases, and, the local Pakistani currency is deprecated. Therefore, Covid-19 uncertainty is negatively related to the value domestic currency of Pakistan.

The VAR model is also explaining that Covid-19 uncertainty reduces further uncertainty. As coefficients of both lags are significant and negatively related to its variable. On the other hand, the exchange rate fluctuation also creates further covid-19 uncertainty. Therefore, we can say the bivariate link present between the exchange and the covid-19 uncertainty.

Stability Condition

Table 4
Stability test for VAR model

Eigenvalue		Modulus
-.5072258		.507226
-.2963676	+ .4104106i	.506232
-.2963676	- .4104106i	.506232
.398365		.398365

The following table is showing the stability condition of the VAR model and, all values are less than one; therefore, the VAR model is stable

Conclusion

The exchange rate of Pakistan rupees in terms of the dollar is affected by the COVID-19 uncertainty in the first lag. Therefore, it can increase the volatility of the exchange rate. Both variables are affected by the bivariate relationship. Covid-19 uncertainty affects the exchange rate of Pakistan and the exchange rate fluctuation also enhances the Covid-19 uncertainty.

Policymakers should focus to eliminate this uncertainty with proper policy announcements for strategies regarding any type of unobserved or unpredicted uncertainty. The policy should not create another uncertainty to increase the volatility of the exchange rate.

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