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Research Article

Cultural Dimensions And Stock Market Response: Analyzing The Impact Of Covid-19 Pandemic On Individualism And Power Distance

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ABSTRACT

The purpose of study is to analyze the stock market reaction to Covid-19 pandemic in framework of cultural diversity that is individualism and power distance. This study considered daily data of stock market, growth in Covid-19 confirm cases and cultural values for 40 countries from January 2020 to December 2021. The Covid-19 cases data were collected from the website of Corona-virus Resource Centre (JHU-CRC) John Hopkins University and other variables like GDP, economic freedom, stringency index from the WB, IMF and OXFORD COVID-19 Government Response Stringency index of the world. The average returns are negative and fluctuated during pandemic. The finding shows the presence of cultural effect as a moderator and indicates that stock markets are more affected during the pandemic where individualism and power distance is high. The study recommends the significance role of human behavior integrating the cultural differentiation and substantial repercussions for policy makers, academicians and investors.

Key words: Covid-19, Individualism, Power Distance, Macro Economic factors and Stringency index.

1. Introduction:

The Covid-19 pandemic also known as Corona virus, started from Chinese city Wuhan in December 2019. The destruction caused by SARS-Cov-2 around the globe is a transmittable virus among the human being. On 11th March 2020 the World Health Organization declared that the Covid-19 is pandemic. According to World Health Organization, the confirmed patients are above 21 million and more than 771,000 have passed way. The China, USA, UK, Iran, Spain and France have been suffered extremely by the pandemic Covid-19. It has an impact on the lifestyle of the community, travelling, gathering parties and economic measures of the world's populations (Zhang, Hu, & Ji, 2020). The pandemic affects various sectors of the society which caused the massive damages to the world economy such as travelling, tourism education, and lifestyle. The current pandemic brought a huge vagueness among the societies and arise many questions. How fatal syndrome really was, how long the government imposed the curfew? What type of economic policy implement by the government during the pandemic? When all the people of a country get vaccine? What would be the society behavior to pandemic? What would be the stock market reply to pandemic? Are the various societies would react differently to corona because of the difference in their national culture? In this situation it's quite difficult to make any predictions due to such a massive vagueness.

This study focuses on the stock market reaction to the Covid-19 pandemic in the context of culture differences. These culture differences are based on individualism and power distance societies. The stock market around the globe reacts unusual negative returns and highly volatile during the Covid-19 pandemic (Al-Awadhi, Alsaifi, Al-Awadhi, & Alhammadi, 2020a; Jahanshahi, Dinani, Madavani, Li, & Zhang, 2020). For instance (Alfaro, Chari, Greenland, and Schott 2020) for USA and (Ashraf 2020c) analyzed 64 countries' stock markets and concluded the declined in the returns during the Covid-19. The different country had different market reaction and diverse by large extent as reported by World Bank in 2020. Schmeling (2009) studied the cross-country culture and concluded that culture influences the sentiment of stockholders and it shows the reaction of

stockholder to some news. During the Covid-19 the shareholders of the different countries react differently because of the predominant national culture. It identifies the sensitivity of individualism and power distance. Various studies suggested that the current pandemic enhanced the volatility and decline in stock market returns (Al-Awadhi et al., 2020a; Ashraf, 2020a; Baker & Wurgler, 2006; Ramelli & Wagner, 2020; Zhang et al., 2020). Furthermore, the SOP's for Covid-19 using some specific country characteristic like social distance (Ashraf, 2021), the economic freedom at country's level (Erdem, 2020), the government fiscal and monetary policies at pandemic situation (Guh et al., 2020) provide some sort of protection against economic losses.

In general, the culture is the combination of beliefs, norms and shared values which deviate an individual of one society/group from others (Hofstede, 1980). Culture defines the acceptance and rejection of the society by the definition of individual behavior. The overall beliefs and shared values which differentiate a nation from others are called national culture (Hofstede, 1980, 1984; Hofstede, Hofstede, & Minkov, 2005). Individualism and Power distance are the most important part of the national culture and varied around the globe (Hofstede, 1980); House, Hanges, Javidan, Dorfman, and Gupta (2004). The Individualism and Power distance dimensions of culture are the most significant aspects of stock market returns (Kwok & Tadesse, 2006). The high value of individualism means that an individual has less association within the society and vice versa. The people of such societies are careless or less responsible.

This study considered national culture in two aspects i.e., individualism and power distance. The develop economies mostly show high individualism and low power distance aspect of national culture, while the emerging economies show the low value of individualism and high-power distance aspect of the national culture. Previous studies lack the empirical testing regarding the stock market behavior in light of the culture values, specific to Covid-19 pandemic. First contribution of this study is that it bridges this link by empirical testing and provides new insights to the literature. Second, this study considered both developed and emerging economies of the world. Therefore, the result could be generalized over the large population of the world.

After overcoming the national characteristics, projected future economic losses and organized risk due to external and internal factors, this study found the strong evidence that the decline in stock market returns is higher in those countries where the levels of individualism and power distance is high.

2. Literature Review:

In the emergence of Covid-19 epidemic, the stock market of the whole world faced an uncertain situation (Barua, 2020; Contessi & De Pace, 2021; Ozili, 2020), hence many stocks market witnessed massive one-day falls in their share prices. Almost every sector of the economy was damaged (Vasiu, 2020). During the pandemic especially between 24th February 2020 till April 2020, the instability transforms from Chinese stock market to all over the world (Contessi & De Pace, 2021). The 10th largest companies of the US lost significance amounts of money from their accounts during the week of 24th February 2020 (Ozili,2020). During March 2020 the stock market of Bangladesh fall 30% from its peak (Begum et al., 2020). Furthermore, major economies of the world found the decline of UK, Germany, Brazil, and Columbia 37%, 33%, 48%, and 47%, respectively. It seems to be even worse condition as compared to the US stock market (Tomazini et al., 2020). Nemours studies reported that the evolution of new cases and deaths caused by corona has a significant impact on the stock market including China, Spain, France, and Germany. The death ratio was high during 1st March 2020 to 30th April 2020 (Alber, 2020). Other studies also identified the down fall in stock market because of covid-19 pandemic (Adenomon, Maijamaa, & John, 2022; Al-Awadhi et al., 2020a; Elsayed & Abdelrhim, 2020; Gherghina, Armeanu, & Joldeş, 2020; Kartal, Kiliç Depren, & Depren, 2021).

Social studies documented the significance of culture values in an uncertain situation (Vicente, Avina, Torres-Rodriguez, Hargis, & Tellez, 2007). Several studies argued that interpretation of information and respond to that subsequent information of various societies varied due to different value and beliefs of a society (Brochet, Miller, Naranjo, & Yu, 2019; Chui & Kwok, 2008; Xiao et al., 2017). Today we lack the literature regarding the cultural association with natural pandemic and its effect of stock markets.

COVID-19 pandemic provides the opportunity to investigate the cross-country cultural differences that how various societies react to this situation. It spreads all over the world and affected more than 220 countries and territories. Cultural dimensions theory developed by Psychologist Dr. Geert Hofstede at the end of 1970s, it has become an international standard for understanding the cultural differences. Individualism versus collectivism means the link of the people among each other in their community. The large value of individualism means that an individual has no/low connection within society other than their family members. Therefore, the people in such societies become irresponsible of other activities and outcomes. While on the other hand in the collectivist society, each member is loyal and responsible to the society to which he belongs and in response the group may protect their concern. Even in the larger group each member takes care to well-being of the others. Power distance index (PDI) means unequal power distribution among the society members. The greater value of PDI specifies that the community accept inadequate hierarchical division of power where the members of the society know his position in the system. While the low score of PDI indicate that the society member will not accept the unequal power distribution among their society. For instance, the high value of PDI in Malaysia (100) means the team member will not instigate any to step for an activity unless he should be guided and directed for the completion of any task. The less interest by the upper management means the task is not important.

Highly individualized and low power distance societies don't accept any uncertain situation easily therefore more influenced (Hofstede, 2001). If they feel any threat which deviate them from their comfort zone they will react quite sharply, the variance of which is quite slight. While in the collectivism and high-power distance society, one can adopt the uncertain situation easily and can tolerate the risky situation in the normal manner. Their reaction is quite slow when they feel any threat which deviate them from their comfort zone. The current pandemic Covid-19 is a rare event and creates a large ambiguity around the globe where the outcomes of various situations are unknown. The stock market witnessed the bearish trend in response to Covid-19 (Ashraf, 2020b). So, the investors in the countries with high value of individualism and low value of power distance would react savior and high panic and sell the stock even at low price. While on the other hand the society with low value of individualism and high value of power distance may be strong because of high tolerance to ambiguity. Based on the above discussion the following hypothesis is formulated:

Hypothesis:

H_1: Stock market significantly reacts to the Covid-19 pandemic where there is high/low individualism in societies.

H_2: Stock market significantly reacts to the Covid-19 pandemic where there is high/low power distance in societies.

3. Data Description and Methodology:

The study use daily data of forty countries for the period of January 1st, 2020 to December 31st, 2021. The sample size consists of 40 countries included in Hofstede culture index score and all those countries were dropped where the required data were missing. The daily data of Covid-19 confirmed cases are downloaded from the website of Corona virus Resource Centre (JHU-CRC) John Hopkins University, and the stock index data is collected from the website of WWW.investing.com, national culture (individualism and power distance) data is collected from the index of (Hofstede et al. 2005). The data set also include the country level control variables. The nature of the data is a panel data; therefore, this study follows panel regression. The daily stock returns data is regressed with the Covid-19 confirmed cases, control variables and the moderation of cultural aspects. Table 1contains the list of individualized and power distance countries, their score of culture, their key stock markets and date of first confirmed Covid-19 case. The study follows the Ashraf (2000 a, b) approach to analyze the panel data.

$$SR_{c,t} = \delta_c + \beta_1 Covid-19_{c,t-1} + \beta_2 log(Covid-19_{c,t-1} * Ind_{c,t}) + \beta_3 log(Covid-19_{c,t-1} * Pdist_{c,t}) + \sum_{n=1}^{n} \beta_n \gamma_c + \sum_{t=1}^{t-1} \epsilon_t Z_t + \varepsilon_{c,t}$$

$SR_{c,t}$ presents the stock market returns, while the $_c$ and $_t$ stands for country and day respectively, δ_c presents the constant terms, $Ind_{c,t}, Pdist_{c,t}$ indicates the cultural values of individualism and power distance for a country, while γ_c presents the country level control variables that is log of GDP, economic freedom, investor protection, unemployment, while Z_t denote stringency index. For the measurement of Covid-19, the study follow (Ashraf, 2020b) approach that is based on new patients of Covid-19 neither on the increase death cases. Ashraf (2020c), argued that stock returns have negative and statistically significant relationship with Covid-19 confirmed cases not with increases in death. The interaction term of covid-19 and both cultural dimensions are created to test its moderating effect on the stock market.

Table 1 reports the selected sample of countries, the titles of stock market index, the first date of Covid-19 confirmed case in each given country, the number of observations based on daily data and the cultural index value regarding the individualism and power distance on country-level.

Table 1: Score of Individualized and Power Distance

S. No	Country Name	Stock Market	1st Covid-19 confirmed case	Daily Observation	(IND)	(PD)
1	Austria	Austria Stock Market (ATX)	Feb 25th, 2020	49	55	11
2	Australia	Australia Stock Market	Jan 25th, 2020	58	90	38
3	Canada	S&P_TSX Composite	Jan 26th, 2020	52	80	39
4	Denmark	OMX Copenhagen	Feb 27th, 2020	55	74	18
5	Finland	OMX Helsinki 25	Jan 28th, 2020	68	63	33
6	Germany	Frankfurt Stock Exchange	Jan 27th, 2020	51	67	35
7	Hungary	Budapest Stock Exchange	Mar 4th, 2020	61	80	46
8	Ice Land	Nasdaq Iceland Stock exchange	Feb 28th, 2020	69	60	30

9	Ireland	Euronext Dublin	Feb 29th, 2020	56	70	28
10	Italy	Bursa Italian	Jan 31st, 2020	53	75	50
11	Latvia	The Nasdaq Riga	Mar 2nd, 2020	50	70	44
12	Lithuania	The Vilnius Stock Exchange,	Feb 24th, 2020	40	60	42
13	Luxembourg	Luxembourg Stock Exchange	Feb 29th, 2020	73	60	40
14	Netherland	Euronext Amsterdam	Feb 27th, 2020	57	80	38
15	New Zealand	New Zealand Stock Exchange	Feb 28th, 2020	53	79	22
16	Singapore	FTSE Straits Times	Jan 23rd, 2020	58	74	20
17	Sweden	Nasdaq Stockholm	Jan 31st, 2020	67	71	31
18	Switzerland	Switzerland Stock Market	Feb 25th, 2020	63	68	34
19	UK	FTSE 100	Jan 31st, 2020	61	89	35
20	USA	S & P 500	Jan 22nd, 2020	56	91	40
21	Armenia	Armenia Securities Exchange	Mar 1st, 2020	53	22	85
22	Azerbaijan	Baku Stock Exchange	Feb 28th, 2020	69	22	85
23	Bulgaria	Bulgarian Stock Exchange	Mar 8th, 2020	49	30	70
24	Bosnia & Herzegovina	The Sarajevo Stock Exchange	Mar 5th, 2020	48	22	90
25	Bangladesh	Dhaka Stock Exchange	Mar 8th, 2020	57	20	80
26	China	Shanghai Composite	Jan 22nd, 2020	52	20	80
27	Chile	Santiago Stock Exchange	Mar 3rd, 2020	58	23	63
28	Egypt	Egyptian Exchange	Feb 14th, 2020	43	25	70
29	India	BSE Sensex 30	Jan 30th, 2020	56	48	77
30	Indonesia	Indonesia Stock Exchange	Mar 2nd, 2020	63	14	78
31	Kazakhstan	Kazakhstan Stock Exchange	Mar 13th, 2020	58	20	88
32	Kuwait	Bursa Kuwait	Feb 24th, 2020	62	25	90
33	Malaysia	Bursa Malaysia	Jan 25th, 2020	51	26	100
34	Morocco	Casablanca Stock Exchange	Mar 2nd, 2020	68	46	70
35	Paraguay	BVPASA	Mar 2nd ,2020	69	12	70
36	Pakistan	PSX-100	Jan 22nd, 2020	51	14	55
37	Saudi Arab	Tadawul	Mar 2nd, 2020	49	25	95
38	Taiwan	Taiwan Stock Exchange	Jan 21st, 2020	69	17	58
39	Turkey	BIST 100	Mar 11th, 2020	72	37	68
40	Venezuela	Caracas Stock Exchange	Mar13th, 2020	53	12	81

4. Empirical Analyses:

In this section, the study reports the results of the study. Table 2 reports the descriptive/summary statistics of the study. The overall sample of market returns shows the negative value (-0.00205) which shows overall equity market decline over the selected time period. The minimum and maximum value of returns indicates the high fluctuation during the covid-19. Similarly, on average daily 49 corona cases are reported with the high variation. This high variation in reported cases encourages the researchers to examine the living style of individuals across the world. Further, both the individualism and power distance index values also indicates the substantial differentiation. Likewise, the table reports the variation in country specific behavior therefore it is required to be controlled during regression analysis.

Table 2: Descriptive Statistics

Variables	Obs.	Mean	Std. Dev.	Min	Max
Market Returns	14945	-0.00205	43.25	-0.26	3.37
Corona(n-1) cases	14945	49.42	150.865	1.00	859.5
Cultural Value Individualism	14945	49.135	10.34	33.5	69.5
Cultural Value Power Distance	14945	55.325	10.565	33.0	75.0

Log of GDP	14945	8.13	0.95	6.185	10.16
Economic Freedom	14945	69.23	7.85	44.8	82.45
Investor Protection	14945	68.7	13.28	37.0	87.0
Unemployment Rate	14945	7.055	2.56	3.75	13.2
Stringency Index	14945	49.415	14.18	26.5	76.5
Income Support	14945	1.145	0.705	0.00	2.00

Table 3 Correlation

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1. Market return	1.00									
2. Corona(n-1) cases	0.05*	1.00								
3. Cultural value individualism	-0.15*	0.36	1.00							
4. Cultural value power distance	-0.30*	0.17**	0.38**	1.00						
5. Log of GDP	-0.25**	0.16*	0.41**	0.23*	1.00					
6. Economic freedom	0.30**	-0.10**	0.15*	-0.29	-0.51**	1.00				
7. Investor protection	0.22**	0.02*	0.26*	-0.11**	-0.42*	-0.17	1.00			
8. Unemployment rate	0.04*	0.17*	0.07	0.18*	0.38**	0.21	0.31*	1.00		
9. Stringency index	0.05	-0.01**	0.22	-0.04**	0.09*	-0.05*	0.02	0.06	1.00	
10.Income support	0.16*	-0.06*	-0.08*	0.10	-0.05*	0.11	0.06	0.17	0.07*	1.00

Table 3 reports the pairwise person's correlation among the given variables of the selected sample countries. Both the cultural value of individualism and power distance index are negatively correlated to market returns but insignificant. Further correlations among other variables are also insignificant and not relatively high which indicates the low probability of multicollinearity during the multivariate analysis.

Table 4 Base line Regression Analysis – Moderating Role of Culture:

Variables	Market Returns				
	1	2	3	4	5
$Corona_{(n-1)}$ cases	-0.291** (0.031)	-0.309** (0.028)	-0.421*** (0.146)	-0.890** (0.041)	-1.98*** (0.025)
Cultural Value Individualism		-0.027* (0.351)	0.0182** (0.824)	0.021** (0.241)	0.029*** (0.0027)
Log of $Corona_{(n-1)}$ *Individualism			-0.941*** (0.021)	-0.852*** (0.325)	-0.912*** (0.068)
Cultural Value Power Distance				-0.287* (0.014)	-0.365*** (0.014)
Log of $Corona_{(n-1)}$ *Power Distance					-0.039*** (0.0029)
Log of GDP	-0.32 (0.004)	-0.391 (0.035)	-0.471 (0.004)	-0.487 (0.008)	-0.627 (0.099)
Economic Freedom	-0.532 (0.031)	-0.538 (0.028)	-0.478 (0.027)	-0.347 (0.006)	-0.429 (0.12)
Investor Protection	-0.691 (0.39)	-0.712 (0.42)	-0.847 (0.57)	-0.852 (0.52)	-0.872 (0.73)
Unemployment Rate	-0.872 (0.89)	-0.901 (0.84)	-0.974 (0.891)	0.759 (0.612)	0.287 (0.014)
R-squared	0.509	0.538	0.582	0.632	0.681
F-Stat					306.17

*** P< 0.01, ** p< 0.05, * p< 0.1

Table 4; reports the base line regression of this study. For robustness check, the study considers the five models presented by column 1 to 5. 1st model regresses the dependent and independent variables without moderating and country specific variables; the coefficient value of growth in corona cases shows the negative and statistically significant relationship with market returns. It indicates the decline in equity market returns during the covid-19 pandemic. (Alfaro et al,. 2020) argued that the stock market reacts negatively during the corona pandemic. In second column we add the cultural value index and find the same result for growth in corona cases and market returns but the cultural index value is in significant. In 3rd column, we add the interaction of the growth in corona cases and cultural individualism value index, where the table reports the negative and statistically significant relationship with market returns. It shows the statistically significant effect of moderating variables on equity returns. In 4th column, we add the power distance and found its significant contribution towards equity market returns at 90% confidence level. At last, we add all the under-study variables and collectively tested moderating and control variables in the model 5, the significance level of variable increase as well as the value of R^2 jumps from 0.509 to 0.681. Interestingly the significance confidence

level of interaction of the growth in corona cases and power distance index move from 90% to 99%. It has been noticed that all the control variables and moderator variables are statistically significant which otherwise were insignificant from model 1 to 4. It suggests that the stock market returns of those countries where individualism and power distance is high are more affected by corona pandemic. This finding confirmed that culture values have moderating role between covid-19 pandemic and stock market return (Al-Awadhi, Alsaifi, Al-Awadhi, & Alhammadi, 2020b; Alfaro et al., 2020; Fernandez-Perez, Gilbert, Indriawan, & Nguyen, 2021a). Therefore, it supports the argument that people living in individualism-based societies are more irresponsible of other activities and outcomes. While in collective societies, people are more loyal and responsible to which he/she belongs. The coefficient value of GDP and economic freedom shows negative and statistically significant relation, while unemployment, stringency index and income support show positive and statistically significant relationship with stock market. The value of R^2 indicates that 68% of variations in stock returns are explained by variation in the given independent variables and last the F-Statistics value shows that overall model is statistically significant.

Table 5

	(1)	(2)	(3)	(4)	(5)
Corona(n-1) cases	-0.371**	-0.294**	-0.513	-0.351**	-0.912**
	(0.213)	(0.027)	(0.141)	(0.032)	(0.31)
Cultural Value Individualism		-0.001	0.002		
		(0.423)	(0.612)		
Log of Corona(n-1) *Individualism			-0.024***		
			(0.401)		
Cultural Value Power Distance				-0.231	-0.062
				(0.361)	(0.621)
Log of Corona(n-1) *Power Distance					-0.310**
					(0.032)
Democratic accountability	0.052	0.050	0.048	0.029	0.032
	(0.271)	(0.329)	(0.178)	(0.614)	(0.55)
Investment freedom	-0.004	-0.007	-0.004	-0.005	-0.008
	(0.528)	(0.531)	(0.529)	(0.417)	(0.329)
Log of GDP	0.02	0.027	0.024	0.002	0.005
	(0.713)	(0.709)	(0.623)	(0.782)	(0.464)
Stringency Index	0.38	0.37	0.41	0.48	0.521
	(0.013)	(0.018)	(0.014)	(0.028)	(0.025)
Income Support	0.56	0.61	0.68	0.79	0.94
	(0.18)	(0.21)	(0.17)	(0.29)	(0.17)
Daily fixed-effects dummy variables	Yes	Yes	Yes	Yes	Yes
Constant	-0.819	-0.749	-1.920	0.932	0.314
	(0.618)	(0.635)	(0.671)	(0.724)	(0.986)
Observations	1930	1930	1930	1930	1930
R-squared	0.591	0.61	0.621	0.635	0.682

In order to enhance the robustness of findings, the several key adjustments and supplementary analyses are conducted. Firstly, acknowledging the potential variation in stock market reactions during different phases of the COVID-19 outbreak, carefully curated the dateset to maintain a consistent event window across countries. This involved limiting the data to the initial 30 days of local outbreaks for each country, starting from the day of the first confirmed case. This adjustment resulted in a refined sample of 1930 observations, ensuring a more uniform and comparable time-frame across the diverse set of countries considered in our study. Subsequently, re-estimated the specified model with this updated dateset, and the results, as depicted in Table 5, consistently show negative and significant relations for the interaction terms, reinforcing the robustness of our primary findings. Secondly, to address concerns regarding potential omitted variables, we incorporated additional control variables, including stringency and income support indexes from the Oxford COVID-19 Government Response Tracker (OXCGRT) database, the anti-self-dealing index from Djankov et al. (2008), and the regulatory quality index from the World Governance Indicators database of the World Bank. Even with the inclusion of these supplementary controls, the interaction terms sustained their significant coefficients, further substantiating the stability and reliability of our core results.

5. Conclusion:

The COVID-19 had been dented the entire global economy. The large number of people lost their lives and business. In addition, the COVID-19 has negatively affected the stock market of various countries. This study answers the question that how cultural variations among the different country's response to stock market in the context of COVID-19 pandemic? To answer this question, this study analyzes the stock market reaction to Covid-19 in the presence of moderating role of culture. For this purpose, the study considered 40 countries where covid-19 cases were confirmed. The result indicates that overall stock market decline during the Covid-19 pandemic. Same result is supported by (Al-Awadhi et al., 2020; Alfaro et al., 2020; Ashraf, 2020c). Based

on the finding, the study concluded that those countries whose culture is individualized and power distance is high were more affected during the pandemic in relation to those countries whose culture is collectivized (Ali et al., 2021; Fernandez-Perez, Gilbert, Indriawan, & Nguyen, 2021b). The findings of this study suggested that culture is an important factor and should be controlled while examining the relationship between any pandemic and equity market returns. The outcomes of this study have significant implications for investors, government and academicians. The finding of this study indicates that the investors overreact to the contrary shock integrating the cultural biases. Further other study may consider other factors of culture and also analyzed the pre and post period of the pandemic that would present the true image of stock market of the world.

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