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RESEARCH PAPER

Impact of Panic Buying Behaviours on Global Food Chain during Pandemic

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ABSTRACT

During a pandemic, panic buying behaviour is one of the causes of supply chain disruption. This study aims to explore the impact of panic-buying behaviour on the global food chain. The analytical study is selected, data is collected with a 100-sample size and a quantitative research technique is applied to investigate an association & dependency between panic-buying behaviour and the food supply chain through SPSS. The results of the regression illustrate that 76.1% strong correlation & 58 %dependency between panic buying behaviour and the food supply chain during the pandemic as compared to 88.3% very strong correlation & 78% dependency between panic buying behaviour and the food supply chain before the pandemic. These results are successfully validated through criteria validity and the reliability test is 0.81 which is highly accepted and reliable. This proves that there is an impact of panic buying behaviour on the global food supply chain during pandemic and it is recommended that supply chain resilience is a way to minimize panic buying behaviour through the latest technology.

KEYWORDS Corona Virus, Global Food Chain, Panic Buying Behaviour

Introduction

The first patient of Corona Virus disease was identified in China and rapidly increased in various countries through social interaction among people. Due to this, COVID-19 has declared a global pandemic disease by WHO on March 11th, 2020, and WHO recommended a lockdown strategy for affected countries. The countries implemented a lockdown strategy and the global lockdown disrupted lives, livelihoods, communities & businesses in various countries. The first impact of the lockdown is that citizens depend on mass media which changes their behaviour in terms of buying behaviour. The panic buying created demand uncertainty during the lockdown situation. The second impact of the lockdown is that panic buying behaviour had disrupted the global food chain route. The third impact of the lockdown is that disruption occurred in the supply chain process in lead time, order quantities, demand fluctuation, and fragilities in network structure by creating SC design issues. These impact increased demand uncertainty by decreasing the supply/distribution of products. The reason is that there was an interruption in the distribution of products from china to the rest of the world that created demand-supply shocks in various countries. The supply shocks occurred in El Salvador, Guyana, Sri Lanka, Canada, Argentina, Panama, India, Djibouti, and Pakistan due to the non-availability of the supplier, demand shocks occurred in Colombia, Angola, and Ghana due to the non-fulfilment of customer demand and distribution shocks in Ecuador, Peru Guatemala, Venezuela, Nigeria and Congo due to non-distribution of the final product. Hence, demand shocks, supply shocks & distribution shocks increase consumer price index/inflation and distorted the global market by reducing international tradetrade (Rodrigue & Luke, 2020),(Zhu, Chou, & Tsai, 2020), (Khanal, Poudel, Lamichhane, & Ajanthan, 2020), (Dunford, et al., 2020),

(Kiernan & DeVita, 2020),(ILO, 2020), (Abbas, et al., 2020), (Hobbs, 2020),(Inoue & Todo, 2020).

It is pertinent to mention that the researcher had worked on the food supply chain and taken a single perspective to solve the problem by ignoring the panic buying behaviour perspective in the food supply chain. Meanwhile, the International Journal of Logistics Management called for papers on supply chain pandemic issues and has accepted 25 research papers for supply chain COVID-19 research. It has found that four research papers were theory-grounded research and the researcher had applied resource-based theory, institutional theory, and resource dependency theory which did not help to explain the real-world problem. Hence, there is a need to develop theoretical concepts and frameworks for dealing with pandemic research through organization theories (Wamba, Wamba, Bryde, Foropon, & Gupta, 2022).

This study has proposed media dependency theory for investigating the relationship & dependency between panic buying behaviour &food supply chain during & before the pandemic.

The following are four parts of this study. The second part will describe a literature review on causes of supply chain disruption; mass media, misinformation/fake news, panic buying behaviour, and supply chain disruption. The third part will describe the research methodology in terms of research design, collection of data, variables, measuring variables, quantitative research technique, validity, and reliability of research. The fourth part will describe the results of the study and the fifth part will discuss the results, the limitation, and the way forward.

Literature Review

Causes of supply chain disruption before pandemic

The disruption in the supply chain occurred due to demand uncertainty, storage, and access restrictions, demand drops, reduced productivity, transportation failure, price fluctuation, natural disasters, raw material shortages, panic buying behaviour, cyber-attack, and a pandemic. The demand uncertainty is the cause of supply chain disruption due to behaviour changes of citizens in terms of bulk buying of food items and media influence is one of the causes of behavioural change for panic buying behaviour among citizens. This illustrate relationship between mass media, panic buying behaviour, demand uncertainty, and the food supply chain. This relationship is based on media dependency theory which illustrates that there is a relationship between mass media and society/people in terms of behaviour effect. Hence, lack of research on the panic buying behaviour and food supply chain through mass media theory by taking a large sample size at the international/country level (Dulam, Furuta, & Kanno, 2021), (Yuen, Wang, Ma, & Li, 2020), (Jung, 2017).

Mass Media and Misinformation/Fake News

Digital media, electronic media, and print media are the source of mass media for people to know what is happening. Many people shifted toward digital media during a pandemic like COVID-19. There is a need to investigate whether citizen shift toward digital media in any country during a pandemic like COVID-19. For this purpose, a qualitative study did on the investigation of people's behaviour toward digital media in the northern city of India. The results show that citizen depends on digital media in the northern city of India. In this regard, there is a need to check misleading/misinformation/fake news for the betterment of the public. Misinformation/fake news is not new because it occurred before the pandemic and affects brand image. The matter of fact is that misinformation/fake news is creating insecurity that leads to terror, nervousness, finger-pointing, disgrace, aggressive

aggression, and panic (Dhanashree, Chauhan, Bhatia, Sethi, & Chauhan, 2021), (Nicomedesa & Avilab, 2020).

Mass Media and Panic Buying Behaviour

The influence of mass media is one of the factors that cause panic buying behaviour during unexpected events like the pandemic. The misinformation/fake news disseminated by various sources on mass media about the shortage of necessary items in the market during the pandemic/lockdown situation. The pandemic/lockdown situation created panic among citizens to buy products in bulk from the market and a shortage of products occurred in the market. There is a need to investigate whether citizen behaviour changes due to misinformation/fake news in any country during a pandemic like COVID-19. In this regard, the toilet paper problem was pointed out in Tokyo city Japan. When the disease spread in China, people buy toilet paper in bulk in Tokyo due to the dissemination of misinformation/fake news on toilet paper in Tokyo (Abbas, et al., 2020), (Prentice, Quach, & Thaichon, 2021).

Panic Buying Behaviour and Supply Chain Disruption

The panic buying behaviour suddenly increases the demand for necessary items during unexpected events like the pandemic. The demand uncertainty has occurred through panic buying behaviour, resultantly supply chain disruption occurred. Panic buying behaviour is one of the causes of supply chain disruption that exposed flaws in efficient and optimized supply chain systems during COVID-19. It harmed the supply chain process because organizations did not fulfil customer demand due to the lockdown. There is a need to investigate whether panic buying behaviour did supply chain disruption in any country during a pandemic like COVID-19. The study was conducted in New Zealand to investigate panic buying behaviour did supply chain disruption or not. The panic buying behaviour during the pandemic compared with festivals/events like Christmas, Easter, and Black Friday before the pandemic. It had found that the pattern of panic-buying behaviour is high for the years 2020 and 2021 as compared to previous years and this pattern increased demand for a necessary item that was not catered by organizations (Dulam, Furuta, & Kanno, 2021), (Yuen, Wang, Ma, & Li, 2020).

Media Dependency Theory

As discussed above, the influence of mass media is a cause of panic for citizens, and citizen's behaviour was changed to buy food items in bulk. This bulk buying created demand uncertainty which disrupted the food chain. This illustrates that media dependency theory applies to global disease. The media dependency theory states that there is a relationship between media and society in terms of emotional effect, behaviour effect, and psychological effect. This study has taken behaviour effect of media dependency theory for this study to examine the relationship between panic buying behaviour and food-disrupted supply chain (Jung, 2017). The hypothesis for panic buying behaviour and food supply chain is given below:

Hypothesis

H_0: There is no relationship/dependency between panic buying behaviour and the food supply chain

H_A: There is a relationship/dependency between panic buying behaviour and the food supply chain

Material and Methods

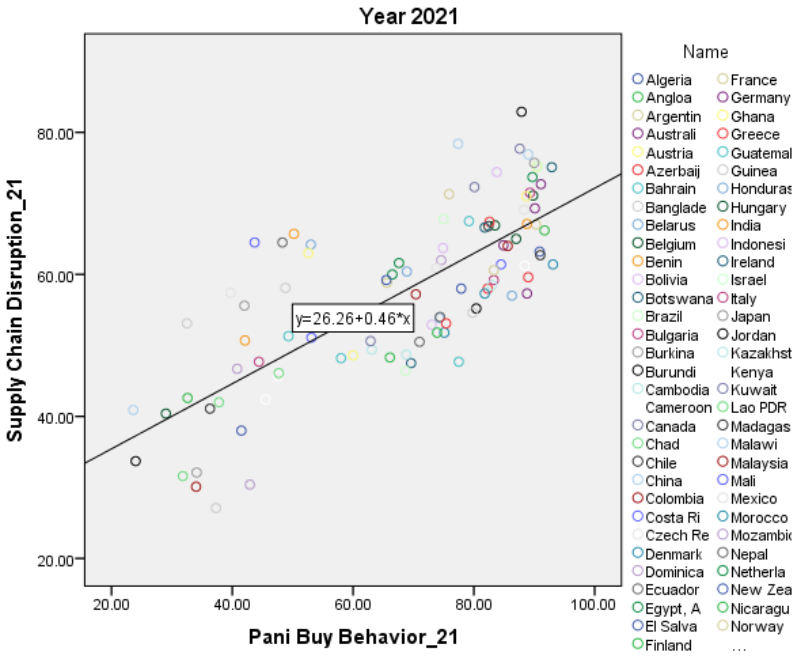
This study has applied an analytical study to forecast the effect of panic buying behaviour on the food supply chain and provide a solution accordingly. For this purpose, there is a need to examine the relationship/dependency between panic buying behaviour and the food supply chain in the context of the pandemic situation. Food affordability is a measuring variable of panic buying behaviour and defines as the capacity of people for purchasing food items during shocks and food availability is a measuring variable of supply chain disruption and define as the capacity of the country to handle the food supply system in event of a disruption. In this regard, data on food affordability and food availability are collected for various countries from economist impact. The total population is 113 countries and selected 100 countries as sample size and 100-sample sizes are an ideal sample for getting good results. The data of 100 countries are collected from economist impact for the years 2021 and 2019 (Ranganathan & Aggarwal, 2019), (Provost, 2011),(Bapta, 2020).

Techniques of Quantitative Data Analysis

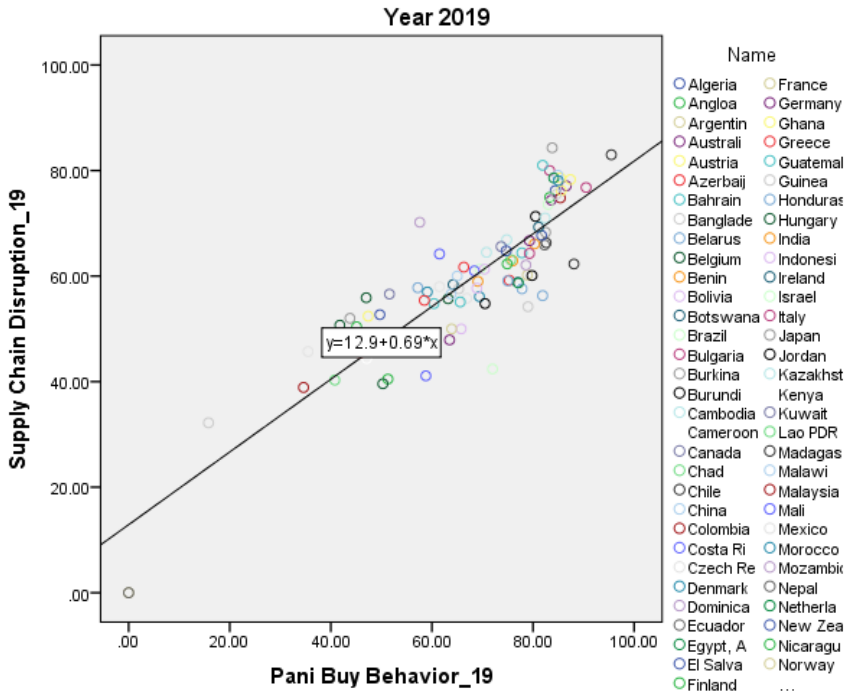
Regression Analysis

The regression analysis will apply to determine the relationship/dependency between panic buying behaviour and supply chain disruption for the years 2021 and 2019 through SPSS. For this purpose, the assumptions of regression are linearity, normality, homogeneity of error variance, and independence of errors that need to be fulfilled before applying it (Ernst & Albers, 2017). The assumptions are given below:

Food affordability/panic buying behaviour and food availability/supply chain disruption are two measuring variables that measure at an interval scale. The Food affordability/panic buying behaviour is the independent variable and food availability/supply chain disruption is the dependent variable. This study has applied a scatter plot to determine the linear relationship and it has been found that there is a linear relationship because the fit line determines that data fall within the linear domain at graph 1&2:



Graph 1: Linear Relationship



Graph 2: Linear Relationship

Food affordability/panic buying behavior is the independent variable and food availability/supply chain disruption is the dependent variable and no outlier has been found in figure 1:

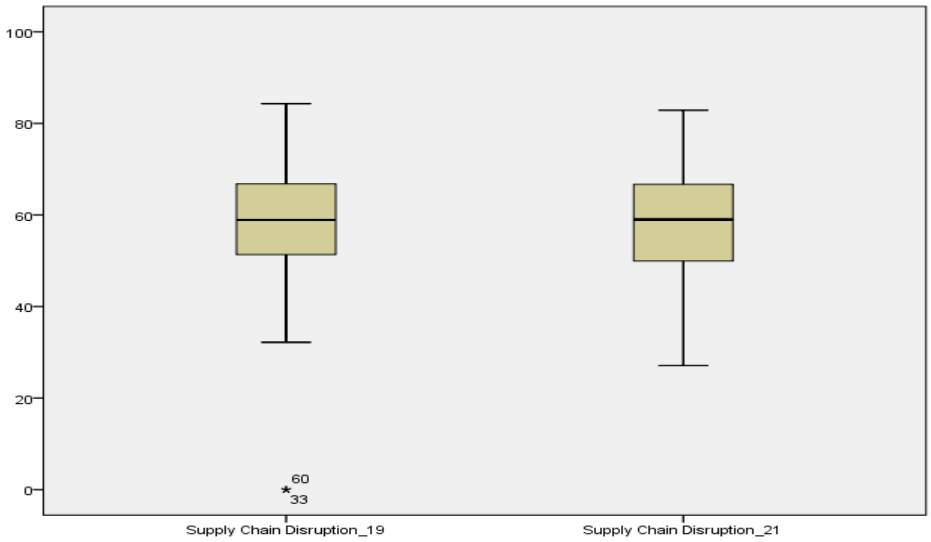


Figure 1: Outlier

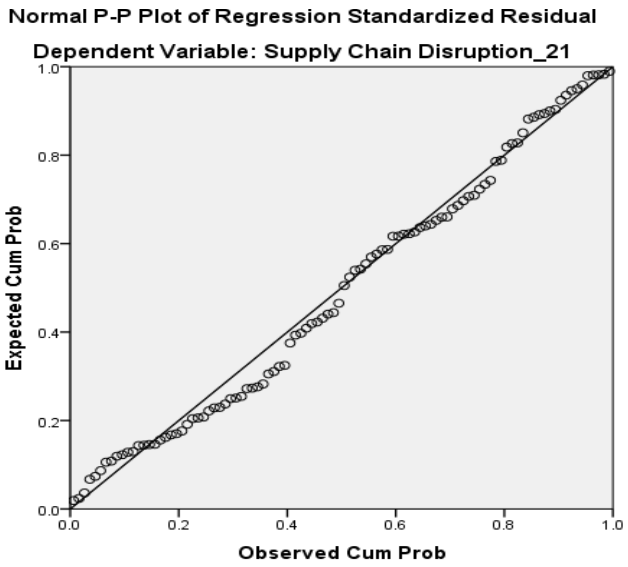
The sample size of panic buying behaviour and supply chain disruption is same in table 1

Table1
Homoscedasticity

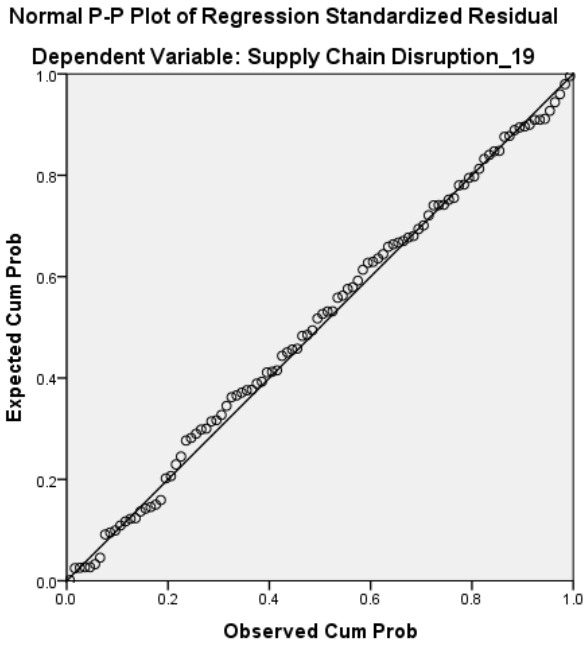
Descriptive Statistics

	N	Mean	Std. Deviation
Panic Buy Behavior_19	100	66.8870	18.14401
Panic Buy Behavior_21	100	68.7510	19.99146
Supply Chain Disruption_19	100	58.9770	14.15603
Supply Chain Disruption_21	100	57.8000	12.04691
Valid N (listwise)	100		

The data is normally distributed by checking residual (errors) of regression line in graph 3&4:



Graph 3: Residual (errors) of regression line



Graph 4: Residual (errors) of regression line

This study has applied the Durbin-Watson test to determine the independence of observation. The panic buying behavior is independent variable and supply chain disruption is dependent variable. It has been found that values are independence of observation in table 2

Table 2
Independence of Observation

Sr.No.	Year	Durbin-Watson
1	2021	1.918
2	2019	1.959

Validity and Reliability Test

The proposed concept will be validated through criterion validity by using convergent validity. After validity, a homogeneity test will be applied to investigate the reliability of research through Cronbach's α for reliability test. If the reliability value is greater than 0.60, it means highly reliable and acceptable (Heale & Twycross, 2015), (Forero, 2014), (Daud, Khidzir, Ismail, & Abdullah, 2018).

Results and Discussion

This study has found that panic buying behaviour had adverse effects on the supply chain during a pandemic like COVID-19 and wanted to investigate the relationship and dependency between panic buying behaviour & food supply chain. For this purpose, Alternative Hypothesis # stated that there is a relationship/dependency between panic buying behaviour and the food supply chain. The regression analysis is appropriate to determine the relationship/dependency between them in table 3:

Table 3
Correlation and Regression

Year	R	R Square	Adjusted R Square	Std. Error of the Estimate
2021	.761[a]	.580	.575	7.85129
2019	.883[a]	.780	.777	6.67832

a. Predictors: (Constant), Panic Buy Behavior_21 &2019

Correlation

The results of the correlation illustrate that strong association between food supply chain and panic buying behaviour at 0.761 value for the year 2021 during the pandemic as compared to a very strong correlation between panic buying behaviour and the food supply chain for the year 2019 before the pandemic at 0.883 value. The correlation coefficient during the pandemic is 76.1% interpreted with the global food index as a good performance range between 80-60 as compared to the correlation coefficient results before the pandemic is 88.3% interpreted with the global food index as the best performance range between 100-80. These results illustrate that during the pandemic correlation reduced from 88.1 to 76.14% which means that there is a factor that reduces correlation. In this regard, there is a need to determine the factor that reduces correlation during a pandemic like COVID-19 through comprehensive research, and this point is ignored at this stage. Hence, the Alternative Hypothesis is accepted and rejects the null hypothesis.

Regression

The regression results illustrate that the dependency of panic buying behaviour on the food supply chain is 58% for the year 2021 as compared to the dependency of panic buying behaviour on the food supply chain is 78% for the year 2019. The during pandemic dependency value 58% is interpreted with the global food index as a satisfactory performance range between 60-40 as compared to before pandemic dependency value 78% is interpreted with the global food index as a good performance range between 80-60. These results illustrate that during the pandemic the dependency reduces from 78% to 58% which means that there is a factor that reduces dependency during a pandemic like COVID-19. In this regard, there is a need to determine the factor that reduces correlation during a pandemic like COVID-19 through comprehensive research and is ignored at this stage. Hence, the Alternative Hypothesis is accepted and rejects the null hypothesis.

Reliability and Validity Test

This study has proposed that panic buying behaviour has an impact on supply chain disruption. The H_A is the criteria of this study which is tested through correlation from regression quantitative research technique. The results show that strong/very strong associations between variables and H_A are accepted. Both criteria and tested criteria are the same and the concept is successfully validated with criteria validity.

The reliability test is applied through SPSS to determine the consistency of measurement. The total item is two and Cronbach's α value is 0.801 which is more than 0.60.

Discussion

The proposed concept of this study is the impact of panic buying behavior on the global food supply chain through mass media theory which is successfully validated and reliability is more than 0.60 which is highly accepted. Hence, there is an impact of panic buying behavior on the food supply chain among 100 selected countries. This dependency/relationship decreased during unexpected events like COVID-19 because various factors affect relationship/dependency and at the same time disrupted the supply chain.

This study has two limitations of this research which have somehow affected it. The first is this study has selected an analytical study which has its limitation. The second is limited data is available because some organizations are still working on introducing new variables for measuring supply chain disruption.

Conclusion

In the end, it is concluded that mass media is one of the causes of panic buying behaviour which increase demand uncertainty and disrupted the food supply chain which will be minimized through supply chain resilience. In this regard, there is a need to investigate whether supply chain resilience minimizes supply chain disruption or not during a pandemic. A research was conducted by initially researching questions about organizational strategy, and tactics to test robustness in the face of Covid-19 during April and May 2020. For this purpose, extensive telephonic interviews and video calls had been taken from supply chain experts around the world to learn about organizational resilience. It had been found that companies investing in supply chain resilience are saving from supply chain disruption because of their approach to supply chain resilience, Investment in leading-edge technologies (data analytics), Creation and maintenance of a risk management culture, Willing to invest in scenario modelling, Ability to gather, analyse and act on data (Port 2020). Future research will investigate the impact of the lockdown situation on food resilience.

Recommendations

It is recommended that there is a need to build supply chain resilience by investing in digital SC technology for minimizing demand uncertainty. For this purpose, there is a need to forecast demand uncertainty by using AI and dynamic simulation algorithms. This will help to predict customer demand and select diversified suppliers from different geographical areas for reacting fast to minimize shock by improving end-to-end visibility through employing scenario planning planning (Russell & Warrington, 2020).

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