International Review of Management and Marketing

ISSN: 2146-4405

available at http: www.econjournals.com

International Review of Management and Marketing, 2025, 15(2), 123-131.

The Transmission Medium of Rumors, and How Does it Affect Stockpiling and Price Hikes for Consumer Goods

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Received: 01 September 2024 **Accepted:** 22 December 2024 **DOI:** https://doi.org/10.32479/irmm.17603

ABSTRACT

This study's central theme is determining the effect of stockpiling on price hikes. Additionally, the media through which rumors are spread and which medium has a more significant influence on encouraging excessive purchasing, known as stockpiling. Stratified random sampling was utilized to get data from 200 participants. The data were analyzed using the partial least squares-structural equation modeling (PLS-SEM) approach with the assistance of Smart PLS 4.1.0.0. This unique work examines the correlation between stockpiling and price increases. The study revealed that stockpiling leads to price increases, mainly when prompted by rumors spread through social media and word-of-mouth (WoM) communication. Social media has a more significant influence on stockpiling compared to word-of-mouth communication. This study's findings offer a precise insight into how rumors systematically impact price hikes. The message explicitly advises buyers from participating in panic buying without verifying information. This study examines the effect of stockpiling on price increases while also recognizing the possible reciprocal impact of price increases on stockpiling. Additional research can be pursued on the subject.

Keywords: Rumor, Social Media, Word of Mouth Communication, Stockpiling, Price Hike.
JEL Classifications: M21, M31, D12

1. INTRODUCTION

The phenomenon of inflation has resurfaced. The recent price spike in consumer goods has hit the country's poor and middle class particularly hard (Bundervoet et al., 2022; Dekimpe and van Heerde, 2023). According to a poll conducted by McKinsey and Company, over half (53%) of European clients expressed increasing price levels as their primary concern by mid-2022 (Bazzoni et al., 2022). The same trend was observed among CEOs questioned in nearly all other regions worldwide, including North America, Latin America, India, and Asia Pacific (Dekimpe and van Heerde, 2023). All around Bangladesh, prices of consumer goods have risen dramatically (Ahmed, 2023). By early 2022, experts and business executives worldwide debated whether the rising trend in inflation was the start of a new inflationary age or simply the result of transitory supply disruptions brought on by the pandemic. Inflation seems likely to continue (Rising Inflation in Bangladesh, 2022). The primary factors contributing to the increase in prices include reduced production, increased consumption, delayed stock release by many stakeholders, limited government oversight or intervention in the market, the spread of fear and rumors, the dissemination of inaccurate data, and trade syndication. The recent increase in consumer goods prices like rice can be attributed to the millers' tendency to stockpile, which

has reduced the number of items available for sale and interrupted the regular supply in the market (Alam et al., 2020). It happens due to panic buying. Panic buying is sometimes regarded as a result of a challenging catastrophic scenario. The situation can induce panic, insecurity, worry, and a feeling of terror among those who are susceptible. The phenomenon of panic buying is more significant than it may initially appear since the stockpiling of goods can lead to disruptions in supply and demand, shortages of specific things, and increased prices for those items of concern (Singh et al., 2021).

To avoid psychological, physical, and social threats from social media misinformation and rumors, people panicked and bought. Politicians and government officials claimed "everything is under control," but social media showed people waiting in huge lines to acquire bare essentials. Social media falsehoods and rumors spread and were validated, causing panic buying in several countries (Naeem and Ozuem, 2022). Consumer panic buying behavior can result from rumors, sensationalism, and deception (Naeem, 2021; Naeem and Ozuem, 2022). Sensational concerns and disinformation spread quickly (Al-Zaman, 2021). Twitter and other social media platforms have become significant channels for exchanging and distributing information. While they might enable swift contact and the exchange of valuable information, they can also promote the dissemination of unconfirmed rumors (Ozturk et al., 2015). The proliferation of social media in the public sphere has resulted in the quick dissemination of fresh information, often leading to the circulation of rumors. However, it is increasingly challenging to identify rumors within the vast amount of information on social media (Bian et al., 2020). The dissemination of these rumors is rapid and can have a substantial effect (Sudhir and Unnithan, 2019). Previously, rumors were disseminated through word-of-mouth (WoM) via online communication platforms, but it had little impact. Nowadays, communication and the propagation of rumors have shifted from oral transmission to visual and written forms and audio messages. These may be quickly shared through social media platforms like Twitter, Facebook, and YouTube (Farid and Hammad, 2022). Many people have taken to social media to share their stories, photographs, and experiences, which has led to an upsurge in panic buying among other consumers (Cogley, 2020; Mao, 2020).

There was significant evidence from Bangladesh that the rumor was that the salt was going to become stock out and the price would also become high. People became afraid of the news, jumping to purchase salt and stockpiling. General people did it for future consumption, and traders did it to make a profit (Rumours Rub Salt in Bangladesh's Healing Onion Wound, 2019). Inflationary spikes in Bangladesh typically follow patterns in the fluctuation of commodity prices on both international and domestic markets. Since 2021, economies like Bangladesh have experienced unexpected and quick rises in inflation alongside the world's developed economies. The rising cost of living is a significant issue for individuals worldwide. When even the minimal minimum of spending still surpasses the amount of money people can make, the situation becomes more apparent, and people get more confused. As more people are harmed, this tension will likely lead to social catastrophe. The effects of commodity stockpiling and commodity prices vary depending on the circumstances. The research is progressing toward identifying the causes of price increases in situations where stockpiling is a concern. Stockpiling occurs when rumors spread, and rumors spread either through social media, WoM, or both. This research aims to identify the medium of transmission that spreads the rumor and what becomes more influential, as well as investigate the impact of rumors on stockpiling and price hikes for consumer goods.

2. REVIEW OF LITERATURE AND HYPOTHESIS DESIGN

2.1. Rumor

Rumors are unverified, frequently inaccurate narratives that disseminate across a group through interpersonal communication, resembling the transmission of contagious illnesses. Rumors can potentially influence crowds' conduct, often resulting in adverse outcomes (Vosoughi et al., 2018; Zubiaga et al., 2018; Rumor, n.d.). Untrustworthy messages are rumors, and online social media has made it much easier to spread the information (Lu et al., 2022). The material can be freely shared and distributed on open platforms without limits, verification, or confirmation (Pathak et al., 2020). Hence, research on gathering information in an environment that encourages spreading rumors can be categorized into two branches: investigating either traditional or social media (Guo et al., 2023). In most cases, people get most of their news from either social media or traditional media, with social media having the upper hand (Kim and Hawkins, 2020).

2.2. Social Media as a Medium of Transmission

To say that social media have grown into an integral aspect of our lives in the last decade would be an understatement. On average, people utilize five different social media sites in a complementing fashion, whether for private messaging with close friends and family or public messaging with a broader audience of acquaintances, coworkers, and friends (Waterloo et al., 2018; Bayer et al., 2020). Looking at eligible audiences aged 18 and up, 80.8% of the global population is active on social media. There are 8.06 billion individuals worldwide, and 61.4% use social networks. This number does not rely on age or internet access. 5.3 billion people use the internet, with 93.4% actively engaging with the content (Dean, 2023). Social media can be beneficial or detrimental to users, depending on the function it serves them. This is similar to a sword with two edges (Widdicks, 2020). Many fake rumors have been spreading during the pandemic, and we are just starting to understand how they spread on social networks, even when there is no crisis. Much of what we learn about how fact-checked rumors spread can be applied to how other rumors (that have not been checked) spread on social media (Vosoughi et al., 2018). Fake news spreads faster on social media than accurate news (Pröllochs et al., 2021; Mu et al., 2024). The proliferation of rumor-sharing on social media has been the subject of numerous studies due to the pervasiveness of these platforms in today's culture.

H_1: Social media have significantly transmitted rumors.

2.3. Word of Mouth (WoM) Communication as a Medium of Transmission

Word-of-mouth (WoM) communication is a strong force in shaping consumer behavior because it allows for the informal transmission

of advice free of commercial bias (East et al., 2008). Academic studies of marketing have long included word-of-mouth (WoM) communications. "WOM stands out as a consumer-dominated communication channel where the sender remains financially independent" (Brown et al., 2007). Word-of-mouth (WOM) has occupied a significant place in marketing for more than half a century. Preliminary studies show that word-of-mouth (WoM) can significantly affect business outcomes (Martin and Lueg, 2013). Managing anxiety, sharing information, managing relationships, and improving self-esteem are the four main reasons people spread rumors in the marketplace (Sudhir and Unnithan, 2014). Word-of-Mouth (WoM) has a significant impact that tends to influence the intention to purchase (Bastos and Moore, 2021).

H_2: WoM has significantly transmitted rumors.

2.4. Stockpiling and Price Hike

There is a risk that social media will exaggerate or misrepresent facts provided by different groups, including government agencies, nonprofits, and politicians. People tend to have a pessimistic view and feel uneasy when they are cognizant of an issue but lack the information to address it (Gesser-Edelsburg et al., 2017). Through people's interactions with one another, the sharing of both local and worldwide news, and the interpretation of public opinion, social media platforms significantly contribute to the development and spread of risk perceptions (Wang et al., 2019). Sometimes, fake news regarding the product influences customers to make heavy purchases. Heavy purchase intention of products causes stockpiling (Rune and Keech, 2023). This stockpiling ensures they have enough essential goods to last through potential future shortages (Shukla, 2020). Customers may purchase extra products and store them for later use in anticipation of price increases. If the primary manufacturer runs out of stock, consumers can buy similar but less valuable products (Paul et al., 2023). When customers tend to purchase more, it will create an artificial crisis, which ultimately causes price hikes for the products (Sabur et al., 2021).

H_3: Social media has a positive impact on stockpiling.

H_4: WoM has a positive impact on stockpiling.

H_5: Stockpiling has a positive impact on price hike.

2.5. Conceptual Framework

This study investigates how rumors are disseminated through social media and word-of-mouth communication. It also evaluates the influence of these media on price increases and the likelihood that price increases will result in stockpiling. It measures the cause-and-effect relationship among variables, which is shown in Figure 1.

3. RESEARCH METHODOLOGY

3.1. Measurement Instrument

The measurement tools used for the constructs were derived from pre-existing validated and reliable literature. All the constructs that have been previously conceptualized in the literature review section. Based on that conceptualization, a focus group comprised two respondents from each sample segment, three academics and three researchers to pretest the questionnaire (Yanakittkul and Aungvaravong, 2020). That means 14 individuals pretested the questionnaire, and it was recommended that a sample size between 5 and 15 individuals is enough for pretesting (Willis, 2005). After considering their insightful feedback and recommendations, we have modified the questionnaire to include a five-point Likert scale ranging from "strongly agree" to "strongly disagree" (Noh, 2011). Surveys based on Likert scales remain prevalent in market research practice (Heo et al., 2022; Yamashita, 2022), and this is extensively utilized in several fields, including behavioral sciences, healthcare, marketing, and usability studies (De Winter and Dodou, 2010).

3.2. Sampling Procedure

Researchers must decide regarding the sample selection method or opt for a sample design for their study. Simply put, a sample design is a precise blueprint created before collecting data to generate a sample from a specific population (Mishra and Alok, 2022). Stratified random sampling is a widely employed technique in contemporary survey design. When partitioning a population into strata, ensuring that the samples within each stratum exhibit a high degree of homogeneity is crucial. This is essential for obtaining accurate estimates of key population parameters (Reddy and Khan, 2023; Ahmad et al., 2023; Subzar et al., 2023). The respondents' socio-demographic profile encompasses their gender, age, educational attainment, and profession. This study examined two segments based on gender and profession. The responses were evenly dispersed between the two categories, with 50 respondents collected from each subgroup, including service, business, students, and other professionals. The total number of responders is 200, with an equal distribution of 50% male and 50% female.

3.3. Data Collection

According to the study conducted by Hair et al. (2010), it is advised that the sample size for a study similar to the current one should be at least five times larger than the total number of questionnaire items. Kline (2011) investigates the sample size problem in his scholarly publication, highlighting the significance of having a sample size greater than 200 participants. Kahai and Cooper (2003) offer a concept of sample size that is contingent upon parameters involving the utilization of 10 samples for a singular observed variable.

The literature mentioned above explicitly stated that a sample size of 200 respondents is sufficient to obtain a dependable outcome. The study primarily focused on collecting 200 responses from diverse participants, as outlined in the sampling technique section.

3.4. Analysis Technique

Partial Least Squares Structural Equation Modeling (PLS-SEM) can analyze intricate structural equation models that involve cause-and-effect relationships (Rigdon, 2014; Richter et al., 2016). It is an appropriate analytical tool for models that contain numerous components and indicators (Hair et al., 2017b). This investigation utilized the Statistical Product and Service Solutions (SPSS) and Smart PLS 4.1.0.0 software.

4. EMPIRICAL RESULTS

4.1. Measurement Model

Partial Least Squares Structural Equation Modeling, or PLS-SEM (Hair et al., 2021), is a second-generation method for analyzing

data within structural equation modeling. Vinzi and Lauro (2005) proposed that Partial Least Squares Structural Equation Modeling (PLS-SEM) is especially advantageous for conducting causal-predictive analysis in scenarios characterized by high complexity and limited availability of theoretical information. Conversely, other studies opted for the PLS-SEM approach due to its superior benefits compared to the covariance approach (Hair et al., 2011; Kline, 2023). Reflective measures depict the relationship between the constructs and the designated assessment items (Hanafiah, 2020). In order to validate a reflective measurement model, it is imperative to comprehend the internal consistency, which can be assessed by measures such as Cronbach's alpha and composite reliability.

Additionally, it is crucial to evaluate the convergent validity by examining loadings and average variance extracted. Lastly, the discriminant validity should also be assessed (Hair et al., 2016). Structural equation modeling (SEM) techniques are suitable for finding crucial elements, examining intricate hypothetical interactions, and assessing the magnitude of relationships between factors. These strategies allow researchers to analyze the overall impact of predictor factors on the result variable using a structured model that includes a wide range of items and constructs (Hair et al., 2021; Sarstedt et al., 2023).

Table 1 displays the demographic characteristics of the participants. This study employed a stratified random sample technique to get the response. The population is categorized according to the respondents' gender and profession. The responders are evenly distributed between males and females, with a 1:1 ratio. 25% of the total sample collection consisted of respondents from various professions, including service, business, students, and others. Most respondents fall within the age category of 21 to 30, with 69.5% of the total. Regarding education level, 45% of the respondents have education below the graduation level, 33% have completed graduation, and 22% have completed post-graduation.

Factor loadings indicate the degree to which an item accurately reflects the underlying construct. Typically, it is advisable to have a factor loading of at least 0.70 (Vinzi et al., 2010). Outer loadings of 0.7 or greater are satisfactory (Henseler et al., 2009; Gotz et al., 2010). In order to establish a satisfactory level of convergent validity, the Average Variance Extracted (AVE) should not go below 0.5. This indicates that the underlying concept accounts for at least 50% of the variability observed in the indicators (Fornell and Larcker, 1981). Construct reliability is a more suitable reliability measure for research utilizing structural equation modeling (SEM). A Cronbach's Alpha and Composite Reliability (CR) score equal to or greater than 0.70 indicates a high level of reliability (Nunnally, 1978; Hair et al., 2009). It is necessary for the threshold values of the study to successfully satisfy the acceptable range mentioned in Table 2 for the study to qualify for convergent validity and internal consistency reliability.

Table 1: Demographic profile of the respondents

Particulars	Frequency	Percent
Gender		
Male	100	50
Female	100	50
Age (years)		
Below 20	2	1
21–30	139	69.5
31–40	34	17
Above 40	25	12.5
Education level		
Below graduation	90	45
Graduation	66	33
Post-graduation	44	22
MPhil or above	0	0
Profession		
Service	50	25
Business	50	25
Student	50	25
Others	50	25

Source: SPSS output

The Fronell-Larcker criterion is a widely used technique for assessing the discriminant validity of measurement models. According to this criterion, the square root of the average variance extracted by a construct should exceed the correlation between the construct and any other construct (Fornell and Larcker, 1981). The prominent diagonal number in Table 3 has demonstrated and verified the soundness of the discriminant validity of measurement models.

The discriminant validity was assessed using the Heterotrait-Monotrait ratio of the correlations (HTMT), which measures the average correlation between different traits relative to the average correlation between the same trait measured by different methods (Hair et al., 2016). Table 4 displays the findings of the HTMT assessment, which provides appropriate discriminant validity. The highest HTMT value observed is 0.649, which falls below the criterion of 0.90 as established by Gold et al. (2001). The measuring approach demonstrated a good level of construct validity.

It is recommended that a statistically significant indirect effect (t-value > 1.96, two-tailed) be considered as evidence for how mediation works (Preacher and Hayes, 2004; Zhao et al., 2010). The postulated trajectories, along with their related β coefficients (Figure 2), standard deviation, t-statistic, ρ values, and the decision of whether the hypotheses were accepted or rejected, are displayed in Table 5. The study compared the standardized path coefficients (β values). It evaluated their statistical significance to measure the strength of the links between the constructs (ρ values). The results corroborated all five hypotheses. The analytical results support hypotheses H_1 ($\beta = 0.279$, $\rho < 0.05$), H_2 ($\beta = 0.402$, $\rho < 0.001$), H_3 ($\beta = 0.557$, $\rho < 0.001$), H_4 ($\beta = 0.186$, $\rho < 0.05$), and H_5 ($\beta = 0.215$, $\rho < 0.05$). The analysis demonstrated a statistically significant positive connection for all hypotheses.

5. DISCUSSION

This study strictly adheres to the stratified random sampling method to assure equal participation from both subgroups, as indicated in Table 1. The model demonstrated a strong level of compatibility, as indicated by the presence of convergent validity, internal consistency reliability, and discriminant validity, as presented in Tables 2-4, respectively. The primary objective of this study was to determine the most influential mediums

Figure 1: Conceptual framework (developed by authors)

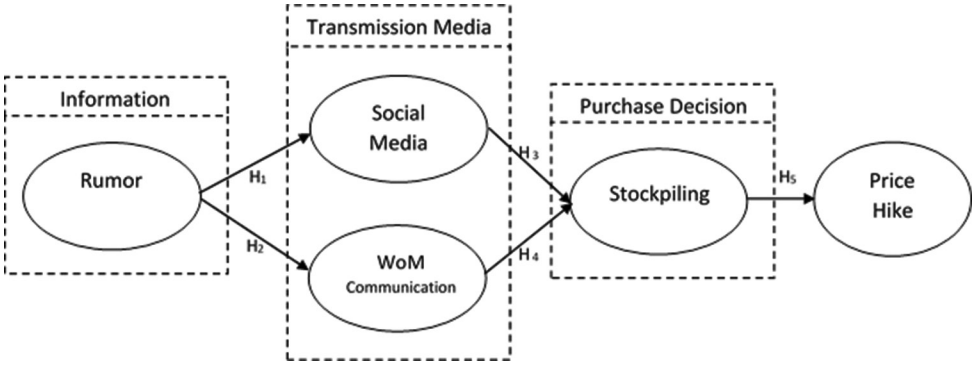

Table 2: Results for reflective measurement models

Variables	Item	Convergent validity		Internal consistency reliability	
		Loading>0.70	AVE>0.50	Cronbach's alpha>0.60	CR>0.60
Price Hike	PH 1	0.907	0.778	0.907	0.933
	PH 2	0.888			
	PH 3	0.907			
	PH 4	0.825			
Rumors	RM1	0.812	0.66	0.829	0.886
	RM2	0.802			
	RM3	0.817			
	RM4	0.818			
Social Media	SM1	0.846	0.672	0.835	0.89
	SM2	0.858			
	SM3	0.861			
	SM4	0.702			
Stockpiling	SP1	0.925	0.758	0.891	0.926
	SP2	0.881			
	SP3	0.925			
	SP4	0.739			
WoM Communication	WoMC1	0.865	0.676	0.842	0.893
	WoMC2	0.810			
	WoMC3	0.823			
	WoMC4	0.790			

Source: Reliability and validity tests by using Smart PLS 4.1.0.0.

Table 3: Discriminant validity – Fornel-Larcker criterion

Variables	PH	RM	SM	SP	WoMC
Price Hike (PH)	**0.882**				
Rumors (RM)	−0.006	**0.812**			
Social Media (SM)	0.124	0.279	**0.82**		
Stockpiling (SP)	0.215	0.040	0.556	**0.871**	
WoM Communication (WoMC)	0.089	0.402	−0.005	0.184	**0.822**

Bold diagonal numbers are the square roots of AVE. Source: Discriminant validity test by using Smart PLS 4.1.0.0

Table 4: Discriminant validity: Heterotrait-Monotrait ratio (HTMT) matrix

Variables	PH	RM	SM	SP	WoMC
Price Hike (PH)					
Rumors (RM)	0.056				
Social Media (SM)	0.142	0.322			
Stockpiling (SP)	0.224	0.096	0.649		
WoM Communication (WoMC)	0.132	0.475	0.138	0.196	

Source: Discriminant validity test by using Smart PLS 4.1.0.0

for transmitting rumors, their impact on stockpiling, and how stockpiling contributes to price increases.

A study discovered that false information spreads extensively and rapidly, penetrating deeply and widely across all types of information, often surpassing the truth significantly (Dizikes, 2018). In most cases, rumors are passed from one person to another, and they may undergo some little modifications each time they are told. As a consequence of this, they have the potential to get inflated and transformed over time (Musa and Fori, 2019; Gordon, 2020). Social media networks (SMN) like Facebook and Twitter are notorious for enabling the dissemination of possibly inaccurate rumors. Empirical evidence has demonstrated that rumors propagate more rapidly inside social media (Choi et al., 2020; Eismann, 2021). Such rumors ultimately lead to stockpiling. Therefore, accumulating goods results in an increase in prices in the immediate future and a decrease in prices in the long run (Hart, 2023).

This study unveiled that rumors are disseminated through social media and word-of-mouth (WoM). Despite spreading rumors through social media, word-of-mouth communication remains the most influential form, as seen by the high β value (0.402). Both social media and word-of-mouth communication have a favorable influence on purchasing decisions, leading to stockpiling. Social media exerts a more substantial influence on accumulating

Figure 2: Model resolution by SmartPLS using PLS algorithm

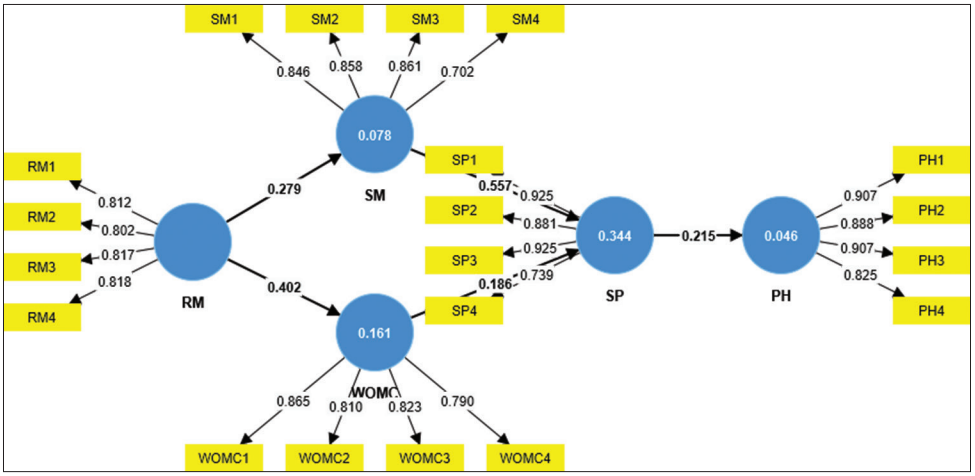

Table 5: General model resolution by Smart PLS using PLS algorithm and Bootstrapping

Path	Estimates (β)	Standard deviation	t statistics	ρ values	Result
RM -> SM	0.279	0.092	3.043	0.002	H_1 Accepted
RM -> WoMC	0.402	0.085	4.709	0.000	H_2 Accepted
SM -> SP	0.557	0.066	8.384	0.000	H_3 Accepted
WoMC -> SP	0.186	0.083	2.234	0.026	H_4 Accepted
SP -> PH	0.215	0.067	3.223	0.001	H_5 Accepted

Source: PLS algorithm and Bootstrapping test by using Smart PLS 4.1.0.0

stocks (as β = 0.557 shown in Table 5) than word-of-mouth communication (as β = 0.186 shown in Table 5). The accumulation of the goods has increased the price level. This is the ultimate correlation between demand and supply. This study explicitly indicated that the price increase results from the accumulation of products. When customers increase their purchases and stockpile items for future use, the middleman takes advantage of this chance to exert control over the pricing.

6. CONCLUSION

Rumors, stockpiling, and price increases can strongly influence markets and customer behavior, which are frequently interconnected in a complicated feedback loop. Price increases have the potential to bolster original rumors, which can then lead to additional stockpiling and panic buying. When customers believe there will be shortages or price hikes in the future, they may participate in stockpiling behavior, meaning they purchase more things than they require. This surge in demand may result in temporary shortages in the market, which may lead to an increase in prices due to the imbalance between supply and demand. It is also possible for speculation or the prospect of future price hikes to be the driving force behind stockpiling. In the hope of selling a commodity or stock at a more excellent price, investors or traders may purchase and retain vast quantities of it. The conduct of speculation can be a factor in the increase of prices, mainly if it creates an artificial scarcity in the market. Most of the supposition was discovered to be erroneous, referred to as rumor. Social media and word-of-mouth (WoM) communication were the primary means of spreading the rumor significantly more quickly. According to this study's findings, the rumor spread through social media significantly impacts stockpiling significantly more than the communication that occurs through word of mouth (WoM). Therefore, the study that "stockpiling causes price hikes" is typically actual was entirely supported by this study. However, the situation is more complicated than that.

6.1. Social and Managerial Implication

Rumors can potentially have significant adverse impacts on society, so the study of rumor dissemination and management is essential. Numerous elements have a role in the propagation of rumors by influencing the process (Chen and Wang, 2020). In order to discourage acts that lead to price increases and market instability, it is important to educate customers on the possible outcomes of hoarding. This will encourage prudent purchasing habits. Strong supply chain management tactics are necessary for businesses to foresee and react to demand variations caused by stockpiling. When demand is high, it is essential to keep customers' trust and loyalty by discussing pricing decisions and implementing transparent pricing policies. In order to overcome regulatory hurdles and earn the public's trust, firms should actively engage with lawmakers and industry stakeholders to push for policies that enhance consumer welfare, fair competition, and stable markets.

The findings of this study provide a clear understanding of how rumors systemically influence price increases. The message clearly discourages customers from engaging in panic buying without first checking any facts. Simultaneously, it is imperative for the government and policymakers to exercise authority to regulate the dissemination of rumors and the accumulation of stockpiles, maintaining control over prices.

6.2. Limitation and Future Work

Illogical stockpiling behavior's intricate components make its elimination unattainable, and we can expect to encounter it

repeatedly in future tragedies and emergency pandemonium (Chen et al., 2020). Further investigation into stockpiling and price spikes could be pursued through several channels to enhance our comprehension and tackle impending difficulties. Examine the psychological determinants that impact stockpiling habits, such as individuals' beliefs of scarcity, sensitivity to risk, and susceptibility to social influence. Examine how behavioral insights might guide treatments encouraging more conscientious consumer behaviors during heightened demand. This study solely focuses on measuring the influence of stockpiling on price hikes while acknowledging the potential reciprocal impact of price hikes on stockpiling. Further research can be conducted on the topic.

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