



## Impact of COVID-19 in Malaysia Economy from Perspectives of Demand, Supply and Games Theory

Abdol Samad Nawi<sup>1</sup>, Mustafa Kamal Mat<sup>2</sup>, Nurzaki Ikhsan<sup>3</sup>, Siti Hafisah Zulkarnain<sup>4</sup>

<sup>1</sup>Department of Postgraduate and Professional Studies, Faculty of Business and Management, Universiti Teknologi MARA Kelantan Branch 18500 Machang, Kelantan, Malaysia

<sup>2</sup>Department of Economics and Financial Studies, Faculty of Business and Management, Universiti Teknologi MARA (Negeri Sembilan) 71300 Rembau, Negeri Sembilan, Malaysia

<sup>3</sup>School of Mechanical Engineering, College of Engineering, Universiti Teknologi MARA, 40450 Shah Alam, Selangor, Malaysia

<sup>4</sup>Centre of Studies of Estate Management College of Built Environment, Universiti Teknologi MARA, 40450 Shah Alam, Selangor, Malaysia

### ARTICLE INFORMATION

Received : December 20, 2022  
 Revised : December 31, 2022  
 Available online : January 01, 2023

### KEYWORDS

COVID-19, Demand, Games Theory, Malaysia, Microeconomics, Supply.

### CORRESPONDENCE

Abdol Samad Nawi  
 Phone : +60173863537  
 E-Mail : samad252@uitm.edu.my

### ABSTRACT

The COVID-19 also known as coronavirus pandemic, is an ongoing pandemic caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). As latest update, 13<sup>th</sup> December 2022, 650 million cases have been reported worldwide, with nearly 6.65 million deaths recorded so far. It is expected the cases will be increased in the future. With pandemic COVID-19 still ongoing, the cases keep increasing, it has affected economies globally, including Malaysia. In Malaysia, from microeconomics perspective, COVID-19 has led to a surge in demand for healthcare particularly face masks. Tremendous demand for face masks leads to government-imposed price control, which government enforced price ceiling for face masks. Furthermore, panic buying in Malaysia is led to disruption in demand and supply distribution systems. This kind of behaviour related to game of theory in microeconomics point of view that indirectly contribute to disruption in demand and supply, which leads to bullwhip effect in Malaysia.

### INTRODUCTION

According to Elengoe (2020), the first case of coronavirus or prominently known as COVID-19 was reported in Malaysia was on 25<sup>th</sup> January 2020. This statement also reported by the World Health Organization, (World Health Organization, 2020). This infectious disease was started by the end of 2019, roughly on December, whereby an occurrence took place in Wuhan City, Hubei Province, China, since December 2019. This virus is recognized to cause respiratory infections in humans. Unfortunately, unlike any other diseases that we experienced; this virus had widely spread to

other countries as fast as lighting as compared to others.

Without warning, this virus rapidly spread to other countries such as Europe, Asia, Africa and even including small island. Due to the unprecedented and uncontrollable situation happened around the world, the World Health Organization (WHO) had classified this circumstance as a pandemic on 11<sup>th</sup> March 2020, cited by Cucinotta, D., & Vanelli, M. (2020).

As the cases keep increasing around the world, many countries decided to take a rigid way, such as lockdown, closing the border or preventing the flow

of people and products crossing the borders around the world, including Malaysia. This can be seen in this situation; Europe countries such as Italy, Spain, UK, and others, enforce a national lockdown to prevent COVID-19 getting worst. Korea on the other hand, according to Lee et al. (2020) align with report cited by Dighe et al. (2020), instead of enforce lockdown, they steadily controlled the transmission by approaching regimented masking, conducting vigorous testing as well as conducting a highly technology contact tracing. However, in Malaysia, instead of lockdown, like most countries who favoured this method, on 18th March 2020, the government of Malaysia had introduced the Movement Control Order (MCO) to encounter the COVID-19 pandemic, (Malaysia Dutch Business Council, 2020).

This paper will be tackled two theories in microeconomics point of view that effect Malaysia economy, which are demand and supply, and game of theory. Firstly, the aim of this paper is to show the changes of the demand curve of face masks and how their prices have evolved from a pre-COVID-19 world of today. Thus, government intervention in price control. Due to overwhelming demand in face masks by consumers, government-imposed price ceiling for this product to protect consumers right. Secondly, it showed on how panic buying created a game of theory in micro perspective that leads to disruption in demand and supply for certain products. As a result, it causes the bullwhip effect in the system.

## **METHOD**

The research method is implemented conceptually by using literature review. The concepts of demand, supply and games theory will be identified and explained to determine the impact of COVID-19 on Malaysia economy. Arguments and findings reveal from previous researchers will be used in making discussions, recommendations, and conclusions of the study.

## **DISCUSSION**

### **PANIC BUYING CREATES GAME OF THEORY**

The pandemic tempted crisis of self-centred behaviour, greed and anxiety of being left with, nothing has caused the consumers to choose based on “sucker’s payoff” which in turn has caused a disparity between the hoarders and those left with

nothing. It showed on how panic buying created game theory in microeconomics standpoint that leads to disruption in demand and supply for certain products. As a result, it causes the bullwhip effect in the system.

Before going deeper on how panic buying leads to disruption in demand and supply systems, let go, to the issue whereby panic buying relatively applied in the microeconomics game of theory. It shows on how game theory applied during COVID-19 that eventually affect Malaysia’s microeconomics outlook.

When the first MCO imposed in Malaysia on 18<sup>th</sup> March 2020, there is oddly big crowds and long queues were seen in supermarkets in whole the country. People were grabbing crazily to toilet paper, rice, cooking oil, instant noodles, hand sanitizers and others. All supermarket, including small shops facing the same problem because consumers unexpectedly do the panic buying. Eventually, in a blink of time, all the foods were empty on the shelves. Demand unexpectedly increases due to panic buying behaviour among consumers.

This scenario is also stated by McMaster University (2020) supported by Yau et al. (2020). They said, during natural disasters and health crises, people probably develop herd behaviours’, such as panic buying. In this case, health crisis takes place. COVID-19 is the main reason people developed peculiar behaviour. According to Yuen et al. (2020), panic buying is a phenomenon that occurs when consumers buy unusually large quantities of certain products in anticipation of a disaster or crisis. Such a phenomenon can have undesirable effects. Panic buying can lead to an actual product shortage. As a result, it can limit or prevent the most vulnerable groups, such as the elderly and low-income individuals particularly, from accessing certain products. Nevertheless, it can also exacerbate fears and uncertainties about the disaster or crisis. (McMaster University, 2020).

Panic buying, creating shortages of items around the world and is affecting the supply chains of many different products. This generates negative externalities in societies as cited by Yuen et al. (2020). The more people perceive they are at risk of getting the disease, the more likely they want to protect themselves. Subsequently, the more protection they prepared for themselves, they will become eager to buy necessities products, staple

food, medical supplies and others. Interestingly, they tend to develop the assumption that products are relatively scarce during COVID-19 and even more anxious when they see empty shelves or queues in stores and supermarkets. Due to that, they feel inspired to buy the products immediately.

This is when game of theory takes place. The decision of whether to buy products in a socially responsible manner, otherwise to hoard them, is related to game theory (Stiff, 2020). In other words, a choice based on the recognition of actions made by others will affect the outcome of the choice. In other words, game theory is an analytical approach through which strategic choices can be assessed.

Game theory can also be considered as a “study of ways in which interacting choices of economic agents produce outcomes with respect to the preferences of those agents, where the outcomes in question might have been intended by none of the agents”. There are various types of games based on the number of players as well as perfect and imperfect information in the market. This approach is based around the understanding that our payoff in some situations is based not only on what we do, but what on others do too. For instance, getting the food we want from a supermarket is dependent on us and almost other shoppers acting sensibly too. If we decide to be socially responsible, that is of little effect of it (Stiff,2020). Otherwise, if we are selfish, accompanied by others, it will be triggered panic buying circumstances.

How we relate panic buying situation with the game theory in microeconomics perspectives? Let say, we take instant noodles as an example.

Figure 1: **Game Theory of Panic Buying Situation (Source: Stiff, 2020)**

		PUBLIC	
		Not Stockpile	Stockpile
INDIVIDU A	Not Stockpile	1 Pack / 1 Pack	10 Packs / None
	Stockpile	None / 10 Packs	10 Packs / 10 Packs

Based on the Figure 1, in a formal collusion, all consumers reach an agreement on a common stockpile for the instant noodles. The best strategy on the above table is to get instant noodles that benefit to all consumers relatively. This means,

each person buys based on the quantity they needed instead of buying for security, especially during COVID-19. When everyone buying a 1 pack of instant noodles, there is no urgency for suppliers to produce the products immediately. Everyone can enjoy buying it without worrying too much. However, during this pandemic COVID-19, the situation is totally different. People start to become greedy and severe. Instead of buying like a normal condition, they start to buy vigorously. They feel motivated to fulfil their own needs rather than thinking others who also need this item. This is what Stiff (2020) mentioned previously.

Everyone buying instant noodles with the large quantity at 10 packs. However, as is often the case in economics, by stockpiling and by everyone else also stockpiling, we will automatically know that demand for this product will be less immediately in the market. The shelves in all supermarkets will be empty. By everyone stockpiling, it means we create the risks of vulnerable people not getting any without we notice it.

This situation is completely against Nash equilibrium. Think rational is the key to preserved society and economics. As cited by Myerson, R. B. (1999) this kind of behaviour regularly inconsistent and foolish that violates the predictions of perfect rationality. Thus, due to this behaviour, people start hoarding supplies. As a result, it further escalates panic among the public, and in turn more people will resort to panic buying and deplete the supplies.

Even worst, it creates shortages of necessary products. We are seeing shortages occurs immediately and must face it, by hook or by crook. Since there are more shortages of these necessary items, people who were not participating in panic buying before start to fear that their spending power will erode, and that supply will never return to the shelves. (McNamara, 2020).

This leads to overflowing in demand amid COVID-19 outbreak in this country. It causes manufactures facing difficulties to fulfil the demand from consumers in a short period of time, chances of shortage in raw materials increased, disrupting supply chain systems directly put a tension on the social system.

The disruption in demand and supply inevitably caused the bullwhip effect. This is the whiplash-like effect of the global supply chain that makes it difficult to stock the shelves fast enough to keep up

with a sudden high demand level. This can cause more panic and lead to higher demand.

According to Lee et al. (1997), the bullwhip effect is a distribution channel phenomenon in which demand forecasts yield supply chain inefficiencies. It occurs when there is a drastic change in consumer demand causes the companies in a supply chain to order more goods to meet the required demand. The bullwhip effect usually flows up the supply chain, starting with the retailer, wholesaler, distributor, manufacturer and then the raw materials supplier as shown in Figure 2.

Figure 2: **Bullwhip effect (Source: Lee et al. (1997))**



For many supply chain leaders, this presents the enormous and potentially costly challenge of dealing with the bullwhip effect. When major swings in inventory occur from panic buying, the impact of this sudden demand is magnified as it moves upstream in the supply chain. The customer feels desperate. The retailer loses potential sales and customer service suffers. Distributors are left scrambling to determine who should get how much of a given product in a shortage, and manufacturers are overwhelmed with sudden, unanticipated spikes in demand. (Reese, 2020).

The primary causes of this bullwhip effect are little or no visibility into demand patterns and limited understanding of demand drivers. This is what happened during pandemic COVID-19, there is a sharp increase in demand. Sellers need to fulfil inventory at the right speed, in the right places, at the right time.

However, what panic buyers likely don't realize is that they are stocking up signs as a fake demand contributing to a whole slew of bullwhip effect problems further up the supply chain. In the end, supplies and sellers, manufacturers are struggling to keep up with stock-outs and rising demand.

Overall, among all the panic buying and fear of COVID-19, the biggest thing to take out of all of this is to stay calm. Therefore, to avoid the situation getting worse in Malaysia, the government of

Malaysia has called for calm and urging its people to buy rationally Chung, (2020). Suppliers are recognizing the sudden spike in demand, and this could lead to big market shifts, but the biggest thing is to understand that most have excess stock that they are currently selling.

## CONCLUSION

In conclusion, whether a community can be resilient or collapse in the face of adversity may depend on how individuals, government authorities, businesses and other actors in civil society behave. All must work together during a pandemic and find a new approach to adopt this situation. While economic showed signs of instability this time and expected to be vulnerable for a long time in the future, government, especially needs to provide incentives and new opportunity to public, to strengthen the economy.

## REFERENCES

- [1] Azman, N. H. (2020). New ceiling price for face masks unnecessary and ambiguous, pharmacists say. *The Malaysian Reserved*.
- [2] Brinca, P., Duarte, J. B., & Faria-e-Castro, M. (2020). Is the COVID-19 Pandemic a Supply or a Demand Shock?.
- [3] Cheung, S. N. (1974). A theory of price control. *The Journal of law and Economics*, 17(1), 53-71.
- [4] Chung, C. (2020). Keep calm and stop panic buying. *The Star*. Available from <https://www.thestar.com.my/news/nation/2020/03/14/keep-calm-and-stop-panic-buying>
- [5] Corporate Finance Institute. (n.d.). What is a Price Ceiling? Available from <https://corporatefinanceinstitute.com/resources/knowledge/economics/price-ceiling/>
- [6] Cucinotta, D., & Vanelli, M. (2020). WHO declares COVID-19 a pandemic. *Acta Bio Medica: Atenei Parmensis*, 91(1), 157.
- [7] Dean, E., Elardo, J., Green, M., Wilson, B., & Berger, S. (2020). Demand, Supply, and Equilibrium in Markets for Goods and Services. *Principles of Economics*:

- Scarcity and Social Provisioning (2nd Ed.).
- [8] Dighe, A., Cattarino, L., Cuomo-Dannenburg, G., Skarp, J., Imai, N., Bhatia, S., ... & Boonyasiri, A. (2020). Response to COVID-19 in South Korea and implications for lifting stringent interventions. *BMC medicine*, 18(1), 1-12.
- [9] Elengoe, A. (2020). COVID-19 Outbreak in Malaysia. *Osong Public Health and Research Perspectives*, 11(3), 93.
- [10] Glazer, A. (2020). Price controls don't work – but mask rationing is the exception that proves the rule. *The Conversation*, Academic rigour journalistic flair. <https://theconversation.com/price-controls-dont-work-but-mask-rationing-is-the-exception-that-proves-the-rule-136595>
- [11] Lee, C. (2004). Competition policy in Malaysia (No. 1649-2016-135865).
- [12] Lee, E., Chen, Y. Y., McDonald, M., & O'Neill, E. (2020). Dynamic Response Systems of Healthcare Mask Production to COVID-19: A Case Study of Korea. *Systems*, 8(2), 18.
- [13] Lee, H. L., Padmanabhan, V., & Whang, S. (1997). The bullwhip effect in supply chains. *Sloan management review*, 38, 93-102.
- [14] Lim, L. L. (2020). The socioeconomic impacts of COVID-19 in Malaysia: Policy review and guidance for protecting the most vulnerable and supporting enterprises, *International Labour Organization*, pg 1-104.
- [15] Malaysian Dutch Business Council (2020), MCO Updates.
- [16] McMaster University. (2020). Pandemics and panic buying.
- [17] Myerson, R. B. (1999). Nash equilibrium and the history of economic theory. *Journal of Economic Literature*, 37(3), 1067-1082.
- [18] Ong, J. (2020). Putrajaya dropping price ceiling for face masks to 70 sen.
- [19] Reese, J. (2020). bullwhip effect: What happens to the supply chain when you buy 100 rolls of toilet paper? *Kinaxis*.
- [20] Sulaiman, Z., Abu Hassan, M. R. (2020). Covid-19: KKM minta orang ramai elak 3S, amal 3W, ingat S.O.P.
- [21] Stiff, C. (2020). The game theory of panic-buying – and how to reduce it.
- [22] Tan, V. (2020). Malaysia's hand sanitiser, rubber glove manufacturers in overdrive as demand spikes over COVID-19 fears.
- [23] Teo, R. (2020). New price ceiling for face masks a costly burden for businesses.
- [24] Timbuong, J. (2020). Our economy loses RM2.4bil every day MCO is active, says PM. *World Health*
- [25] Organization (2020), COVID-19 in Malaysia.
- [26] Yau, E. K. B., Ping, N. P. T., Shoesmith, W. D., James, S., Hadi, N. M. N., & Loo, J. L. (2020). The behaviour changes in response to COVID-19 pandemic within Malaysia. *The Malaysian Journal of Medical Sciences: MJMS*, 27(2), 45.
- [27] Yuen, K. F., Wang, X., Ma, F., & Li, K. X. (2020). The Psychological Causes of Panic Buying Following a Health Crisis. *International Journal of Environmental Research and Public Health*, 17(10), 3513

## AUTHORS BIOGRAPHY

### Abdol Samad Nawi

Prof. Dr Haji Abdol Samad bin Nawi was born in Selangor, Malaysia. He obtained a Doctor of Philosophy (PhD) in Economics, University of Southampton, United Kingdom (2007). He has 35 years of teaching experience and is currently serving as the Rector of UiTM Kelantan Branch.

Besides that, he also has vast experience in establishing international cooperation and industrial linkages as he used to be a Visiting Professor at the University of Sistan and Baluchestan, Zahedan, Iran, and Karaganda Economics University of Kazakhstan (KEUK), Kazakhstan.

In the field of research, he actively conducts research studies and has deep expertise and interest

in the topics of poverty, total factor productivity, international trade, small and medium enterprises/industries, knowledge economics, business cycle and mark-up, economic growth, and economic development.

#### **Mustafa Kamal Mat**

Mustafa Kamal bin Mat is a Senior Lecturer at the Economics and Financial Studies, Faculty of Business and Management, Universiti Teknologi MARA (UiTM), Negeri Sembilan Branch. He holds a Master of Business Administration (MBA) from Universiti Kebangsaan Malaysia (UKM). Actively involved in published and presenting papers in the field of Financial Management, Students Development and Entrepreneurship. He has more than 15 years of teaching experience in Finance and Financial Management.

#### **Nurzaki Ikhsan**

Dr Nurzaki Ikhsan is a Senior Lecturer at the School of Mechanical Engineering, College of Engineering, Universiti Teknologi MARA (UiTM) Malaysia, and Head of Human Capital Development & Entrepreneurship Department for Malaysian Academy of SME and Entrepreneurship Development (MASMED). His current research interests include experimental and computational mechanics, design process, vehicle dynamics and entrepreneurship technology.

#### **Siti Hafsa Zulkarnain**

Sr Ts Dr Siti Hafsa bt Zulkarnain is a Senior Lecturer at the Centre of Studies of Estate Management, College of Built Environment, Universiti Teknologi MARA (UiTM), Shah Alam. She holds a Doctor of Philosophy awarded by Universiti Teknologi Malaysia (UTM) and joint supervision with University of Tsukuba Japan. Actively as a researcher in the field of Property Valuation and Disaster Management (Flood). The findings of this research have been presented and published in leading journals and conferences at the national and international levels.