Effect of Coronavirus disease (COVID-19) to tourism industry

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Abstract— The coronavirus disease 2019 (COVID-19) is a new pandemic that spreads primarily through contact with an infected person when they cough or sneeze. The outbreak of COVID-19 is starting in China then spreading to worldwide that contributes to large number of deaths (40,598 deaths, 1st April 2020). The COVID-19 is a disease causes respiratory illness with symptoms such as a cough, fever, and in more severe cases, difficulty breathing. To preventing spreading of this pandemic, many countries implementing lockdown procedure to stopping the chain of infection for this new disease. The government-ordered lockdowns have disrupted life for billions and in the same time creates economic collapse scenario. The country with the most COVID-19 infections reported a record surge in unemployment. Therefore, this research calculates the effect of COVID-19 to tourism industry for affected countries in the worldwide. This study evaluated the impact using supply and demand curve to detect the economic changes in tourism industry. The result shows COVID-19 CREATES panic among public that contributes to lower demand in tourism industry. This is one of effect because of disease spreading including lockdown approach that implemented in current situation. This scenario, contributes to lower demand price by customer. Therefore, according to market equilibrium of supply-demand theory, the price of tourism sector is keep decreasing parallel with decrement in demand. The finding of this study is very important to government in preventing and stopping decrement demand in tourism industry. The government need to introduce a mechanism that economy and in the same time developing anti-virus for COVIC-19. If the action of prevention is not mange properly, the tourism industry will face more decremental effects that creates economic collapse.

Keywords— COVIC-19, Supply-demand curve, Market equilibrium, Tourism industry.

I. INTRODUCTION

Coronavirus disease 2019 (COVID-19) is an infectious disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). COVID-19 has been traced back on November 2019 by the first case detect in China. COVID-19 defined as an infectious disease caused by a new virus. This virus was spread very fast. As report by World Health Organization (WHO) the total confirmed cases of COVID-19 worldwide are 823,626 cases with 40,598 deaths (1th April 2020) as shown in Figure 1. COVID-19 spreads primarily through contact with an infected person when they cough or sneeze. It also spreads when a person touches a surface or object that has the virus on it, then touches their eyes, nose or mouth. COVID-19 virus can live up to 72 hours.

COVID-19 has given significant impact on the economic development worldwide. With the large-scale quarantines, travel restrictions, and social-distancing measures drive a sharp fall in consumers and business expenditure. This situation was created economic recession globally. However, many efforts have been done by government in order to reduce the spread of COVID-19 virus. For example, a few countries were performing a lockdown approach for movement control order (MCO). The impact of this approach are consumers stay at home, businesses lose revenue and lay off workers and unemployment levels rise sharply.

Besides that, several recommendations were suggested in order to avoid the spread of COVID-19 virus such as frequent hand washing, social distancing (maintaining physical distance from others, especially from those with symptoms), covering coughs and sneezes with a tissue or inner elbow and keeping unwashed hands away from the face. It is also suggested to used masks. This is because until now there is no vaccine or specific antiviral treatment for COVID-19. In hospital, doctors were managed the patients of COVID 19 by involving treatment of

symptoms, supportive care, isolation and experimental measures. Therefore, the National Institutes of Health (NIH) mentioned several group that have high risk of developing complications of COVID-19 that are young children, people aged 65 years and above and women who are pregnant.

II. LITERATURE REVIEW

Research regarding COVID-19 suggested that SARS-CoV-2 started by bats before moving into pangolins, and then into humans. Current research concluded that snakes might be the missing link. However, the latest paper refutes this theory, adding more evidence that pangolins are the link. Most scientists agree that bats are a reservoir for SARS-CoV-2. They also agree that to reach humans, the virus needs an intermediate host (Medical News Today, 2020). Centers for Disease Control and Prevention (CDC) are responsible in monitoring the outbreak of a new COVID-19. Figure 1 shows the spreading map of COVID-19 provided by WHO.

Fig.1: COVID-19 spreading map

The first identified of COVID-19 virus is a person from Wuhan, China. Then, this virus has spread worldwide, leading WHO to declare this situation as a pandemic phenomenon, which means this new disease was spread worldwide (Medical News Today, 2020). The symptoms of COVID-19 are varying from person to person that may produce few or no symptoms. However, it can also lead to severe illness and may be fatal. Common symptoms including fever, breathlessness, cough and potential loss of taste or smell. This symptom may take 2–14 days.

COVID-19 can spread from person to person through small droplets from the nose or mouth which are spread when a person with COVID-19 coughs or exhales. These droplets land on objects and surfaces around the person. Other persons then catch COVID-19 by touching these objects or surfaces, then touching their eyes, nose or mouth. Persons can also catch COVID-19 if they breathe in droplets from a person with COVID-19 who coughs out or exhales droplets. Therefore, it is very important to stay more than 1 meter away from a person.

According to WHO (2020) for avoid infection and to slow transmission of COVID-19, persons are encouraged to follow the following suggestions:

• Wash hands regularly with soap and water or clean them with alcohol-based hand rub.

• Maintain at least 1-meter distance between you and others persons coughing or sneezing.

• Avoid touching your face.

• Cover mouth and nose when coughing or sneezing and stay home if you feel unwell.

• Refrain from smoking and other activities that weaken the lungs.

• Practice physical distancing by avoiding unnecessary travel and staying away from large groups of persons.

According to World Health Organization (2020), the highest cases of COVID-19 is United State of America that are 163,199 cases and the second country is Italy with the total cases are 105,792 (2nd April 2020). Thus, it is important for all people to prevent and slow down transmission COVID-19 virus by follow the suggestions by WHO.

The COVID-19 give impact on the demand and supply of the products worldwide. The domestic consumers demand in most countries probable to drop sharply. Demand for food, medical assistance and other essential items may rise, but this would be more than offset by lower demand for non-essential goods such as apparel and various services.

Demand would also fall due to other factors such as foreign buyers delaying or withdrawing orders; tourists, both local and foreign, cancelling trips; and the declines in the stock market which erodes peoples' wealth and their willingness to spend. Lower overall domestic consumer demand will have a negative impact on production and employment. The drop-in consumer demand may have a lower effect in manufacturing, where companies could, if they have access to credit, build up stocks of finished goods rather than reduce production and lay off staff. However, the effects on the small-scale services sector are likely to be dramatic (Khan and Yasmine Khan, 2020).

On the supply side, there are also probable to be disruptions in developing countries, as there may be shortages of imported raw materials and spare parts.

However, this is likely to be less of a factor than in developed countries, where long supply chains are now the norm rather than the exception. Moreover, lower fuel prices would help the developing countries, most of who are net importers of energy (Khan and Yasmine Khan, 2020). Therefore, this study will focus on the effect of COVID-19 into demand and supply for tourism industry.

III. ANALYSIS OF SUPPLY AND DEMAND CURVE

The effect of COVID-19 to tourism industry is evaluated using supply and demand curve. The demand function is developed using a few parameters namely tastes and preference of customers, average income of certain countries, price setting of selected goods, customers expectation, number of buyers and economic and environmental scenario. Demand function is the quantity of a good or service that individuals are willing and able to purchase during a fixed period of time. Demand function is an algebraic expression that shows the functional relationship between the demand for a commodity and its various determinants affecting it.

Meanwhile, supply function is determined by important factors namely resource price, production techniques, price of related goods, price expectations, supply stocks and numbers of sellers. A supply function is a mathematical expression of the relationship between quantity demanded of a product with price considering supplier perspective.

In economics, supply during a given period of time means the quantities of goods which are offered for sale at particular price. Hence, the supply of a commodity is defined as the amount of that commodity which a seller (or producer) are able and willing to offer for sale at a particular price during a certain period of time.

Figure 2 shows supply and demand curve for tourism industry in market equilibrium condition. The market equilibrium shows the offer price is 50 with offered quantity is 50 (point A). Market equilibrium is a market state where the supply in the market is equal to the demand in the market. The equilibrium price is the price of a good or service when the supply of it is equal to the demand for it in the market. In economics, economic equilibrium is a situation in which economic forces such as supply and demand are balanced and in the absence of external influences the values of economic variables will not change. When the supply and demand curves intersect, the market is in equilibrium. This is where the quantity demanded and quantity supplied are equal. The corresponding price is the equilibrium price or market-clearing price, the quantity is the equilibrium quantity.
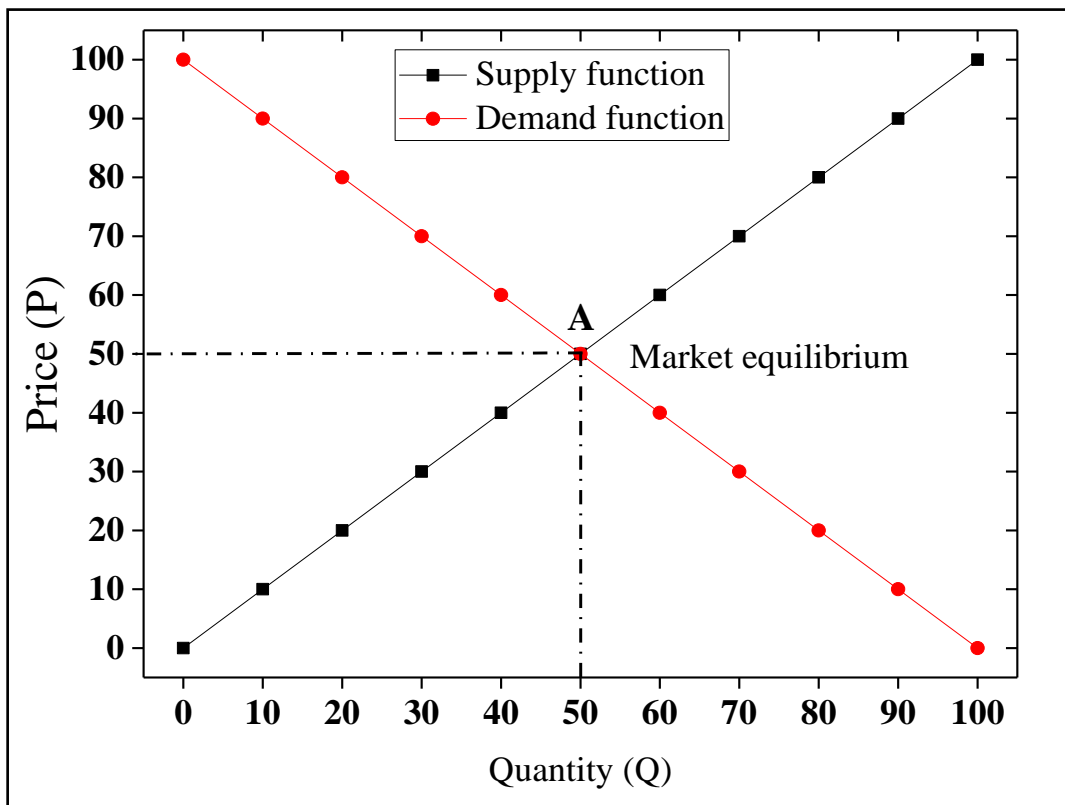

Fig.2: Demand and supply in market equilibrium

In year 2019, COVID-19 has changed the economic landscape with large spreading area involving many countries in worldwide. In the same time, spreading of COVID-19, creates pandemic that contributes to slowing down economic activities in certain country. This scenario will contribute to economic collapse if not handle by proper management approach.

The new coronavirus disease continues to spread around the world, prompting governments to step up efforts to reducing the spread of the disease. The COVID-19 spreads from person to person in close proximity, similar to other respiratory illnesses, such as the flu. The droplets of bodily fluids from an infected person are dispersed in the air or on surfaces by coughing or sneezing. These droplets can come into direct contact with other persons or can infect those who pick them up by touching infected surfaces and then their face.

On March 11 in year 2020, the World Health Organization (WHO) characterized the new coronavirus as a pandemic. Until 1st April 2020, the confirmed cases are 823,626 with spreading to 205 territories. The pandemic also 40, 598 deaths as reported by WHO.

Figure 3 shows the changes of market equilibrium after the decrement shift in demand function. The new market equilibrium is with equilibrium price is 40 and equilibrium quantity is 40 that represented as point B. Comparing to normal market equilibrium in Figure 1, the new market equilibrium shows a decrease value in equilibrium price and equilibrium quantity of the shift in demand function due to outbreak of COVID-19.

Price elasticity of demand is an economic measure of the change in the quantity demanded or purchased of a product in relation to its price change. The price elasticity for tourism industry is generally calculated using Equation (1).

$$PE_D = \frac{\% \Delta Q}{\% \Delta P} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (1)$$

In Equation (1), the parameters are described as follows:

PE_D : Price elasticity of demand,

$\% \Delta Q$: Percentages of changes in quantity demanded,

$\% \Delta P$: Percentages of changes in price.

Changes in quantity demanded,

$$\% \Delta Q = \frac{Q_2 - Q_1}{Q_1} = \frac{40-50}{50} \times 100\% = -20\% \quad \ldots\ldots\ldots\ldots \quad (2)$$
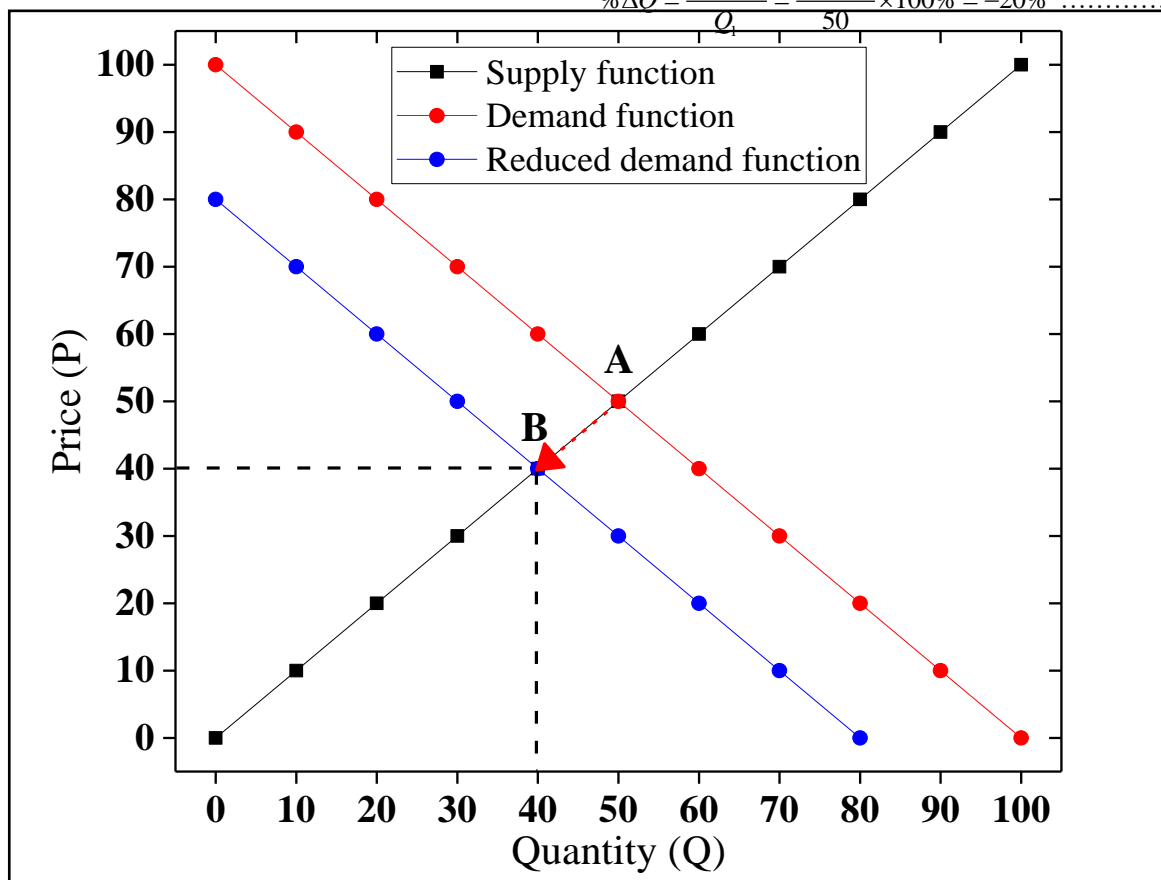

Fig.3: Reduced demand of market equilibrium

Changes in price,

$$\%\Delta P = \frac{P_2 - P_1}{P_1} = \frac{40 - 50}{50} \times 100\% = -20\%$$

Therefore, the price elasticity of demand for tourism industry is:

$$PE_D = \frac{-20\%}{-20\%} = 1.0 \; \dots\dots\dots\dots\dots\dots\dots\dots\dots \; (3)$$

The value of price elasticity for tourism industry is 1.0 which indicates price moves cause substantial changes in its demand.

IV. CONCLUSION

The coronavirus disease (COVID-19) is a new pandemic that affected worldwide human population. The COVID-19 is caused by the virus severe acute respiratory syndrome coronavirus. The disease is primarily spread between human through respiratory droplets from coughs and sneezes. The spreading of COVID-19 contributes to large number of deaths (40,598 deaths by 1st April 2020). The spreading of this pandemic creates panic among public that contribute to decrement trend in tourism industry. This project evaluated the impact of COVID-19 to tourism industry using demand and supply curve. Result shows, the decrement in demand function creates decrement in equilibrium price offered and equilibrium quantity supplied. The price elasticity of demand for tourism industry is 1.0. This value indicates the price elasticity is in elastic range.

The significant of this study is, the mathematical modelling helps government to manage the dynamic behavior of economic sector in tourism industry. In the same time, government policy need to address a proper solution in preventing the spreading of COVID-19 and elevating the status of economy activity in tourism industry.

Further study can be extended to analysis the forecasting of total accumulation cases for COVID-19. In the same time, the awareness of disease management COVID-19 among public also one of interesting research topic.

ACKNOWLEDGEMENTS

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