The Game Theory of Panic Buying During the COVID-19 Pandemic

The global crisis caused by the COVID-19 pandemic sparked an unexpected global response in 2020: panic buying. This was characterized by consumers rushing to stores to overstock on non-perishable goods and personal protective equipment, most notably, toilet paper. This behavior led to significant supply chain disruptions and a collective sense of anxiety among consumers. The understanding of this event becomes clear when viewed through the lens of an economic concept: game theory.

Game theory, an integral part of economics, examines strategic interactions, where each participant's outcome is influenced by the actions of others. Central to this theory is the concept of the Nash equilibrium - a state in which no participant can improve their outcome by unilaterally changing their strategy, assuming the other participants' strategies remain the same.

During the COVID-19 crisis, consumers inadvertently found themselves participants in a non-cooperative game. Each player sought to maximize their utility by procuring necessary goods before they ran out. In essence, this game mirrored a 'Prisoner's Dilemma,' where the optimal outcome for all would be if everyone purchased only what they needed. However, when individuals, driven by fear and self-interest, begin to hoard goods, this behavior can trigger a chain reaction of panic buying, leading to artificial scarcity.

A comprehension of the Nash equilibrium helps explain why such behavior continues, despite its apparent irrationality. If others are panic buying, the optimal response for an individual is also to panic buy to avoid potential scarcity. If others are buying as usual, the individual could either continue buying as usual or decide to hoard, "just in case". Thus, panic

buying becomes the Nash equilibrium. While this is not the socially optimal outcome, it becomes the "rational" choice given the other participants' strategies.

This behavior also highlights the importance of information symmetry and the impact of psychological factors on economic decisions. During the pandemic, fear and uncertainty led many to overestimate their need for certain goods, thereby disrupting normal consumption patterns. The media, by highlighting empty supermarket shelves, inadvertently amplified the fear, leading to more panic buying.

Ideally, as per the invisible hand theory, individual self-interest should lead to a socially optimal outcome. However, during crises like the pandemic, this principle does not always hold true. The panic buying phenomenon exposed a divergence between individual optimization and collective welfare, leading to market inefficiencies.

To combat this, it becomes necessary for policymakers and retailers to employ strategies such as rationing essential goods, providing accurate information about supply chains to reduce fear, and using psychological nudges to encourage more socially beneficial behavior.

In summary, the application of game theory provides valuable insights into the panic buying seen during the COVID-19 pandemic. It demonstrates how individual actions driven by self-interest, fear, and imperfect information can lead to a socially suboptimal Nash equilibrium. This underscores the need for strategic interventions that can align individual behaviors with overall social welfare, particularly during times of crisis.