Research summary

Are individuals rational? Comparing economic theory to behavioural realities

Introduction

Economic theory can help us understand how people behave in the marketplace when it comes to risk. This theory is based on the idea that people act rationally when confronted with economic decisions. For example, if the prices of a product rise, rational consumers would purchase fewer products and rational producers would increase production. If this is not the case, economic theories like the supply and demand model would be ineffective in predicting market prices and quantities. Thus, economic theory should predict how people will act rationally, even in uncertain situations. Furthering our understanding of these behavioural realities can help decision makers—from politicians to economists to egg farmers—as they develop strong economic policies.

A team of researchers, working with the Egg Industry Economic Research Chair at Université Laval, decided to question whether behaviours are predictable in uncertain economic situations. They hypothesized that most individuals do not act rationally when confronted by uncertainty, and therefore relying solely on theoretical predictions that assume individuals are rational is risky. By understanding individual behaviour in the face of economic risk, the researchers sought to provide a policy foundation that accurately addresses how consumers and producers act in the marketplace.

The researchers conducted a three-phase experiment involving 143 Canadians. The experiments involved actual monetary payments, and explored the rationality of participants facing familiar choices. Since the participants' choices resulted in monetary gains or losses, they had an incentive to make choices that maximized their gains.

Phase 1: Rationality in familiar situations

In Phase 1, a series of questions and choices were used to observe how individuals behaved, and if their behaviour aligned with economic theory.

Researchers asked participants whether they would go 25 km out of their way to save $50 on a $275 iPad. The question was asked a second time for a $2,150 MacBook laptop. According to economic theory, both situations are identical: participants must travel an extra 25 km to save $50. The price of the article should have no bearing on going the extra distance; therefore, participants should answer both questions the same way. However, 51% of participants agreed to go out of their way for the iPad but not for the MacBook. This behaviour flies in the face of predictions based on economic theory and individual rationality.

As further choices were put forward, less than 15% of participants acted in a manner consistent with economic theory. These experiments revealed that many individuals make inconsistent decisions, providing evidence that economic theory is limited in predicting individual preferences.

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Phase 2: Adversity to risk

Phase 2 explored how adversity to risk and uncertainty can vary between people. Researchers asked participants to choose between receiving $20 or taking part in a lottery. Participants who selected the lottery option reached into a bag containing red and black tokens—a red token would win them $30 and a black token $15. Researchers ran this test nine times, changing the values of the red and black tokens each time to represent a different level of risk. Participants did not know how many red and black tokens were in the bag, creating uncertainty.

The lotteries were arranged in increasing order of risk, revealing the participants' attitudes toward risk. 22% of participants displayed inconsistent behaviour by selecting the lottery after choosing $20 in a previous, less risky scenario. These inconsistent attitudes prevent economic theory from evaluating personal preferences and developing subsequent effective measures that protect against risk.

Despite these behavioural inconsistencies, researchers observed that 79% of participants reacted unfavourably to uncertainty, 17% were indifferent, while only 4% responded favourably to uncertainty. These results indicate that people generally prefer stability.

Phase 3: Purchasing insurance

During Phase 3, 25 separate draws were held in which participants could lose up to $3 or gain up to $4. Participants were offered two types of insurance for each draw: one guaranteeing a minimum of $0 if the draw yielded a negative value, and one that paid $1 regardless of the amount they chose—or, they could reject insurance altogether. The cost of insurance varied during each draw, and gains or losses were disclosed at the end of each draw.

Three observation draws were held before the experiment started, in which values were drawn but participants neither selected insurance coverage nor made gains or incurred losses. While participants believed the observation draws were random, researchers controlled the draws to determine whether they affected the insurance that participants selected. One group of participants observed negative values, while the second group saw positive values during these three observation draws.

Theoretically, the values noted during these first three draws should not influence the choices made during the experiment, since the gains or losses resulted from a random draw that changed each time.

Despite this, participants who observed negative prices during the observation draws opted for insurance more often than the other group, revealing that the values observed during the learning session affected the participants' behaviours.

Some variations of insurance costs were repeated later in the experiment. Researchers expected that someone facing the same situation of uncertainty and the same choice of insurance would make the same decision. Surprisingly, 85% of participants made two different choices when confronted with the same situation at a different moment. Moreover, the insurance they chose had little to do with their level of aversion to risk determined previously in Phase 2.

Conclusion

The researchers found that, on the whole, individuals have great difficulty conducting themselves in a manner consistent with their stated preferences. Since many public policies are based on the idea that individuals are economically rational, this observation serves as a caution to decision makers. As this research shows, it is possible that individuals cannot identify their preferences and are unable to respond to risk in keeping with these preferences. As such, when developing economic policies, decision makers can look beyond economic theory to ensure policies are flexible and can respond to individuals' economic actions, recognizing their inherent irrational tendencies.

This fact sheet is based on the thesis by **Simon Doré-Ouellet** entitled *Préférences individuelles envers la stabilité des marges : De la théorie à la pratique*, Université Laval, 2016.

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