INFLUENCES OF RISK ATTITUDE AND EMOTIONAL STABILITY IN NEWSVENDOR DECISIONS

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ABSTRACT

In this study, we investigate the impact of emotional status and risk propensity in newsvendor decisions and whether men and women differ significantly in the decision making process. In addition to the DOSPERT scale, developed by Weber, Blais and Betz, to understand risk behaviors in different domains, we will use ERQ, initiated by Gross and John, to assess psychological status of the participants, who will initially be comprised of students; with the possibility of extending the investigation into Amazon Mechanical Turk workers. After analyzing the results, we will conclude whether or not men and women exhibit similar patterns in the decision making process. Emotional status is included because of its possible role as a mediator.

INTRODUCTION

In as much as the newsvendor model is considered the cornerstone in operation management discipline, the literature on this topic is vast because of its diverse contexts. Therefore, a review of this vast literature is beyond the scope of this study, which focuses on whether risk attitude and emotional stability play influential role in case of men and women with respect to decision making process in inventory management.

In the traditional newsvendor model, the decision maker is considered risk-neutral. In reality, the individual’s risk attitude toward uncertainty in income generation plays a crucial role in decision making process (Xiao and Yang, 2008, Hie et al., 2015). In fact, it is now widely accepted and confirmed through lab experiment that risk aversion casts an important role in inventory decision (Holt and Laury, 2002). Schweitzer and Cachon (2000) demonstrate that in case of high profit products, an investor exhibits risk aversion behavior. This risk aversion attitude affects the decision making process of a newsvendor when demand is uniform but increasing variability has the potential to dramatically increase or decrease the optimal quantity of order (Keren and Pliskin, 2006).

In low-profit settings, risk aversion is unable to explain newsvendor’s biasness for ‘pull-to-center’ propensity. De Vericourt et al. (2013) demonstrate that risk aversion can explain the outcomes in high-profit condition. Research demonstrates that males make higher orders than females – a situation that can be justified by differences in risk attitude. We add to this evolving stream by focusing on 3 research questions under the conditions that the demand distribution is unknown and an oligopoly situation is present:
Whether men and women, having different risk attitude, differ significantly in terms of decision making process?
To what extent emotional status plays a crucial role in newsvendor ordering with regards to men and women?
Does emotional status act like a mediator in the observed phenomenon?

LITERATURE REVIEW AND APPROACHES ADOPTED IN THIS STUDY

Through the results of empirical study, it has been shown that gender differences are significant from a statistical standpoint in competitive preference setting and that women show a lesser preference for competitive situation than men (Bonte 2015). A similar tone has also been expressed both in psychology (Byrnes et al., 1999) and economics (Eckel and Grossman, 2008) literature, i.e., women are more risk averse than men. Research supports that this is the case not only in lab settings but in field investment decision as well (Croson and Gneezy, 2009).

Balloon Analogue Risk Task (BART) method, Gneezy & Potters method, and Eckel & Grossman method are several approaches to measuring risk attitudes (Charness et al., 2013). In experimental studies, a participant’s risk is assessed to determine the effect of risk propensity (Franco and D’ Angelo, 2010). For this study, the DOSPERT scale, developed by Weber et al. in 2002, is used to fill the void of measuring individual differences of risk taking. The updated version of this scale [included in Appendix B] evaluates both conventional and perceived risk attitudes in 6 sets of risk domains. It has established psychometric properties (Weber et al., 2002). It will be useful too in evaluating the category where risk taking is the most obvious and what type of risk perceptions affect the decision making process.

In the behavioral management science literature as well as in the psychology and economics literature, the decision making process is addressed in the context of both risk attitude and emotional stability (Neisser, 2014; Simon, 1956). New approaches aim to build a comprehensive theory of decision-making which includes an emotional component (Elster, 1998; Peters et al., 2006). But a human is not simply swayed away by emotions; rather he or she reacts by either through the process of ‘cognitive reappraisal’ i.e. assessing a situation to dampen its emotional influence or through the process of ‘expressive suppression,’ i.e. a process of suppressing behavioral expressions of emotional states (Gross, 2002; Gross & Thompson, 2007).

Heilman et al. (2010) show that by effectively downregulating negative emotional experiences, propensity of risk-taking is increased by ‘cognitive reappraisal’ but that is not the case with ‘excessive suppression.’ To understand the individual differences at these two psychological states, Gross & John (2003) created ERQ which consists of 2 scales. These scales make it possible to evaluate these 2 psychological states in such a way that it is possible to eliminate any possibility of confounding effects. Being considered a valid instrument for capturing individual differences in reappraisal & suppression, ERQ has been used in a number of studies that assesses risk taking attitude with respect to emotion (Heilman et al., 2010). Therefore, using ERQ [attached in Appendix C], we will have a valid measure of the extent risk propensity plays in decision making processes.

Prior to conducting the study, the basic newsvendor problem will be explained to the student.
participants and they will be assessed on their comprehension of the subject matter [see Appendix A]. The experiment will be run on-line through Qualtrics. To target a more diverse population, this study will be conducted using Amazon Mechanical Turk. We are hopeful that experimental results from analyzing the results of the instruments as presented in the appendix will be available in early spring of 2016.

APPENDIX A

Inventory Decision for fixed cost and demand price assuming demand is random over a distribution from 10 to 60.

For a demand distribution in which the demand is determined by the sum of 10 dice (six values on each), specify how many inventory items you would order given the information in the statements below.

Maximum possible demand is 60 and the minimum is 10. Assume that this experiment would be continued over a long period of time for each of the specified values.

The demand for this product is therefore random. For example, if you were to order 20 items that cost $10 and sell for $25, then for a certain percentage of the time, the demand will be less than 20 items and you will have to pay $10*(number of items not sold) without any revenue for these unsold items. This will reduce your profit. On the other hand, if you ordered 20 items under this situation, then for a certain percentage of the time, the demand will be greater than 20 and your profit will not be as high as was possible.

Your response is the optimal value that you believe would maximize your profit in the long run. We assume that left over items that do not sell are worthless.

1. Your cost of the product is $10. The product sells for $11.
2. Your cost of the product is $10. The product sells for $15.
5. Your cost of the product is $10. The product sells for $30.
6. Your cost of the product is $10. The product sells for $40.
7. Your cost of the product is $10. The product sells for $50.
8. Your cost of the product is $10. The product sells for $75.
9. Your cost of the product is $10. The product sells for $100.
APPENDIX B
DOMAIN-SPECIFIC RISK-TAKING (ADULT)
SCALE – RISK TAKING


For each of the following statements, please indicate the *likelihood* that you would engage in the described activity or behavior if you were to find yourself in that situation. Provide a rating from *Extremely Unlikely* to *Extremely Likely*, using the following scale:

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<th>5</th>
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<tbody>
<tr>
<td>Moderately Unlikely</td>
<td>Somewhat Unlikely</td>
<td>Not Sure</td>
<td>Somewhat Likely</td>
<td>Moderately Likely</td>
<td>Extremely Likely</td>
</tr>
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1. Admitting that your tastes are different from those of a friend. (S)
2. Going camping in the wilderness. (R)
3. Betting a day’s income at the horse races. (F/G)
4. Investing 10% of your annual income in a moderate growth diversified fund. (F/I)
5. Drinking heavily at a social function. (H/S)
6. Taking some questionable deductions on your income tax return. (E)
7. Disagreeing with an authority figure on a major issue. (S)
8. Betting a day’s income at a high-stake poker game. (F/G)
9. Having an affair with a married man/woman. (E)
10. Passing off somebody else’s work as your own. (E)
11. Going down a ski run that is beyond your ability. (R)
12. Investing 5% of your annual income in a very speculative stock. (F/I)
13. Going whitewater rafting at high water in the spring. (R)
14. Betting a day’s income on the outcome of a sporting event (F/G)
15. Engaging in unprotected sex. (H/S)
16. Revealing a friend’s secret to someone else. (E)
17. Driving a car without wearing a seat belt. (H/S)
18. Investing 10% of your annual income in a new business venture. (F/I)
19. Taking a skydiving class. (R)
20. Riding a motorcycle without a helmet. (H/S)
21. Choosing a career that you truly enjoy over a more secure one. (S)
22. Speaking your mind about an unpopular issue in a meeting at work. (S)
23. Sunbathing without sunscreen. (H/S)
24. Bungee jumping off a tall bridge. (R)
25. Piloting a small plane. (R)
26. Walking home alone at night in an unsafe area of town. (H/S)
27. Moving to a city far away from your extended family. (S)
28. Starting a new career in your mid-thirties. (S)
29. Leaving your young children alone at home while running an errand. (E)
30. Not returning a wallet you found that contains $200. (E)
APPENDIX C

Emotion Regulation Questionnaire (ERQ)
Gross & John 9/03

The Emotion Regulation Questionnaire is designed to assess individual differences in the habitual use of two emotion regulation strategies: cognitive reappraisal and expressive suppression.

Citation

REFERENCES


