

# WHERE DO YOU WANT TO GO SKIING? THE EFFECT OF THE REFERENCE POINT AND LOSS AVERSION

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## Abstract

We reported the results from a simple experiment where participants ( $n = 646$ ) picked their preferred winter holiday from three possible alternatives. To make the experiment as realistic as possible, the alternatives among which participants could choose, were very similar to actual winter holidays offered by an existing travel agency. Our results are consistent with predictions made by prospect theory: alternatives that compare favorably to a reference option are chosen more often than alternatives that compare unfavorably to a reference option. The reference option, experimentally manipulated in this paper, was one of the three alternatives available to participants. Including different reference alternatives into the available choice set changed relative preferences over the remaining alternatives. Our findings provide further evidence that prospect theory can have practical implications for marketers who can influence consumer choice by merely presenting specially composed sets of alternatives.

Keywords: prospect theory, reference point, loss aversion, preference shifts, marketing

## INTRODUCTION

One of the main assumptions of the theory of rational choice is that the decision maker has consistent preferences (see e.g. Luce, 1959, 1977). For

example, alternative A is always (say) better than B, irrespective of whether there is also a C alternative or whether there are just the A and B alternatives.

Conversely, when the assumption of consistent preferences is violated, alternative A can be seen as

(say) better than B under certain circumstances, while alternative A can be seen as worse than B under different circumstances. The change in circumstances can have the form of, for example, broadening the choice set and/or changing the reference point against which the alternatives are evaluated (see e.g. Highhouse, 1996; Herne, 1997).

In the present study we offer new evidence that given different choice sets the preferences/choices of people are indeed different, which is considered irrational by (neo)classical economic theory.

Over the years, evidence of preference reversals has accumulated steadily (beginning with Lichtenstein and Slovic, 1971 and Lindman, 1971; see also e.g. Kahneman *et al.*, 1990; Highhouse, 1996; Seidl, 2002; Bonaccio and Reeve, 2006; Loomes *et al.*, 2010). However, the extent to which such reversals of preferences are generalizable to different decision domains/scenarios is worth investigating (e.g. Ball, 2012).

The choices of participants in our study are consistent with the occurrence of preference reversals. More specifically, their choices can be explained by changing reference states and by loss aversion as described in prospect theory (see the next section for more details).

Prospect theory has been often used to explain decision making under risk. There are relatively fewer studies that apply this theory to riskless decision making (e.g. Kahneman *et al.*, 1990; Highhouse, 1996; Wong and Kwong, 2005; Bonaccio and Reeve, 2006; Huber *et al.*, 2008). As far as we know, there are no studies similar to ours in that they test whether prospect theory can explain riskless choice in decision tasks based on real offers from an actual company (although Bonaccio and Reeve, 2006 also use quite realistic decision scenarios).

Since we have used quasi-real-life decision tasks, our results might also have implications for marketing practitioners. By changing the available choice set of offers, marketers may have the ability to influence the choices of potential customers.

## MATERIALS AND METHODS

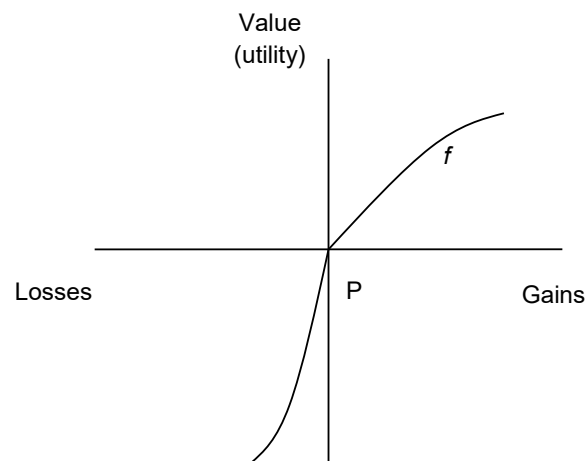
### Expected utility theory

In (neo)classical economics, the decision maker is seen as a rational agent who strives to obtain the highest possible utility from his choice of alternatives, so-called homo oeconomicus. The standard model of such rational decision making is the Expected Utility Theory (EUT). EUT is accepted as a normative model of rational choice and it is often applied as a descriptive model of economic behavior. Important for the present study is the axiom in EUT that the reversal of preferences is not allowed. This means that the decision maker makes consistent comparisons among alternatives (see e.g. Luce, 1959; 1977; Jehle and Reny, 2001).

Even though the EUT is agreed to be the basic economic theory of choice, numerous critiques of this neoclassical model exist. Prospect theory (PT) represents the main challenger of EUT.

### Prospect theory

Prospect theory (PT) is a behavioral economic theory that describes judgment and decision-making processes when choosing between alternatives that usually involve risk. According to PT, decision-makers can show “irrational” reversal in their preferences as the context changes (e.g., Knetsch, 1989; Kahneman *et al.*, 1990; Kahneman and Tversky, 1991). For example, decision-makers



1: An illustrative utility function  $f$  concave for gains and convex (and steeper) for losses

can prefer alternative A over alternative B in one context, but they can prefer B over A in another context.

In PT, the value function represents the subjective value one assigns to outcomes. Kahneman and Tversky (1979, 1991) propose that EUT's utility function should be replaced with an S-shaped value function (see Fig. 1) which:

- is defined over gains and losses relative to a reference point (e.g. The intersection of axes P in Fig. 1);
- is concave in the domain of gains and convex in the domain of losses. This indicates that people are less willing to gamble with profits than with losses;
- is steeper for losses than for gains – which is called loss aversion. Loss aversion expresses that the response to losses is greater than the response to gains (Kahneman and Tversky, 1979). The displeasure associated with a loss of one unit of X (e.g. some valuable product) can be counterbalanced with a gain of approximately 2.2 units of X.

### Prospect theory of riskless choice

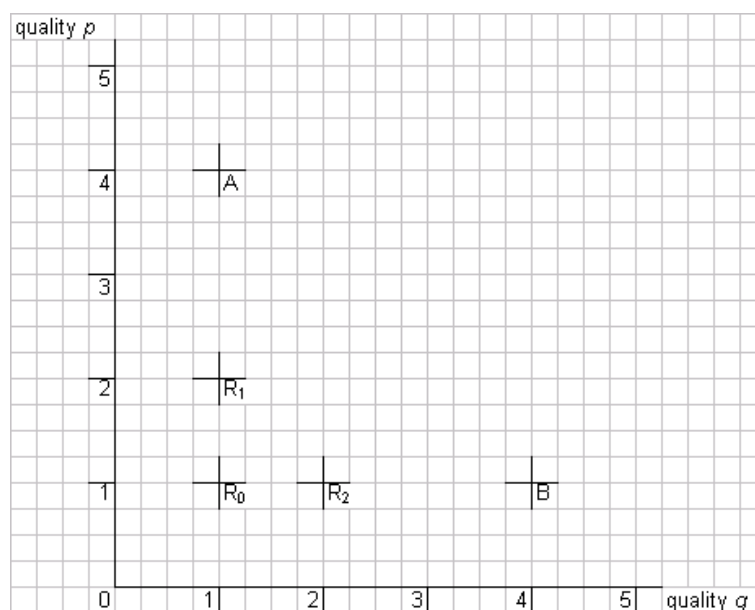
PT mainly deals with decision making under risk (e.g., Kahneman and Tversky, 1979; Tversky and Kahneman, 1992). However, as an extension of choice under conditions of risk, Tversky and Kahneman (1991) propose the application of PT in decision making under certainty. Decision making under certainty (also called “riskless” decision making) concerns choices between options

where the outcomes are known and specific (i.e., the probability of obtaining the selected alternative is equal to 1). This extension of PT represents the immediate theoretical basis of this study.

Similarly to risky situations, PT in riskless choice operates with a value function that is S-shaped and asymmetric and has the same three major properties as described above in case of the value function in risky choice: a) reference dependence (consumption bundles are viewed as gains and losses relative to a reference point), b) diminishing sensitivity (the marginal value of losses and gains decreases with their size), c) loss aversion (losses loom larger than corresponding gains). Consequently, the value function for riskless choice has the same shape as function  $f$  in Fig. 1 above.

Let us now have a look at how two properties of the value function – loss aversion and reference dependence – affect riskless choice according to PT. PT's two intuitions about the riskless choice that are crucial for the present paper can be briefly summarized as follows: 1) Disadvantages of alternatives are more salient, i.e. they have greater weight in the decision process, than their advantages. 2) Advantages and disadvantages of alternatives are always evaluated relative to a reference point. By changing the reference point, the perceived utility of alternatives can be changed (Kahneman and Tversky, 1991).

Fig. 2 illustrates these two intuitions. The decision maker should choose between options A and B. Each option is characterized by two valuable qualities  $p$  and  $q$  (a marginal increase in either  $p$  or  $q$  is equally valuable to the decision maker).



2: Evaluation of two options from different reference points

In Fig. 2, points A and B represent the alternatives, points  $R_0$ ,  $R_1$ ,  $R_2$  are different reference points.

When evaluated from  $R_1$ , option A represents a two-unit improvement (an “advantage” or a “gain”, i.e. an outcome above the reference state) in quality  $p$  compared to  $R_1$ , and A is as good as  $R_1$  in quality  $q$ . When evaluated from  $R_1$ , option B represents a one-unit deterioration (a “disadvantage” or a “loss”, i.e. an outcome below the reference state) in quality  $p$  compared to  $R_1$ , and a three-unit improvement in quality  $q$  compared to  $R_1$ . Because “disadvantages” (or “losses”) are more salient than “advantages”, when evaluated from  $R_1$ , option A should be preferred over option B according to PT. This reasoning is based on Kahneman and Tversky (1991).

Conversely, it is easy to see that when evaluated from the standpoint of  $R_2$ , option B should be preferred to option A. – There is a two-unit improvement in quality  $q$  when B is evaluated from reference point  $R_2$ . There is a one unit deterioration in quality  $q$  when A is evaluated from reference point  $R_2$ , and this deterioration is not sufficiently compensated (due to loss aversion) by the three-unit improvement in quality  $p$  when one compares A and  $R_2$ .

Finally, when evaluated from  $R_0$ , A and B have the same value for the decision maker. – A is better than  $R_0$  in quality  $p$  but worse in quality  $q$ , B is better than  $R_0$  in quality  $q$  but worse in quality  $p$ .

To summarize, the choice between the two options, A and B, is affected by the position of reference point they are evaluated from. From different reference points, the options are evaluated as differently advantageous or disadvantageous relative to the given reference point. And because of loss aversion advantages of options are perceived as less important than their disadvantages. The combined effect of changed reference points and of loss aversions can lead to reversed preferences as illustrated in Fig. 2 (see also Kahneman and Tversky, 1991).

We hypothesize that a shift of the reference point will cause a change of preferences for a service (a winter holiday, in the present case). Thus, testing our hypothesis enables us to test whether decision makers behave “rationally” or “irrationally” (bounded rationally) in the quasi-real-life context under study.

### Related research on riskless choice

A number of experiments show that reference states and loss aversion affect preferences in riskless choice (e.g. Samuelson and Zeckhauser, 1988; Knetsch, 1989; Kahneman *et al.*, 1990). In these experiments the status quo (e.g. being endowed with a particular product) serves as the reference state. The results of these experiments show that people are less willing to sell products they were endowed with than they are willing to pay for (identical) products they do not currently possess.

While our experiment points in the same direction as these recent experiments, it is not the status quo which serves as the reference point in our study, but rather, one of the available alternatives. Kahneman and Tversky (1991) note that a reference state can be the decision maker’s current position, but that it can be also influenced by aspirations, norms, (social) comparisons (Fox and Dayan, 2004; Huber *et al.*, 2008), and expectations (Kőszegi and Rabin, 2006; Knetsch and Wong, 2009). In our study we assume that when an alternative is listed among the available options, it serves as a reference point (because it is by looking at the possible options that one can form their expectations).

Our experiment is methodologically very similar to Highhouse (1996). Participants in his study made a (hypothetical) choice from a choice set of three job candidates A, B, C. Highhouse used a between-subjects design with two groups of subjects. Two candidates (A and B) were included in the choice set in both experimental groups. The third “decoy” (or “reference”, as we would say) candidate was different ( $C_1$ ,  $C_2$ ) in each experimental group.

In the first choice set in Highhouse (1996), candidate A was equally good as  $C_1$  in quality  $q^1$  and slightly better in quality  $p$ ; candidate B was worse than  $C_1$  in quality  $q$  and considerably better in quality  $p$ . In the second choice set, candidate B was equally good as  $C_2$  in quality  $p$  and slightly better in quality  $q$ ; candidate A was worse than  $C_2$  in quality  $p$  and considerably better in quality  $q$ . Notice that these comparisons have the same structure as the comparisons illustrated in Fig. 2 above.

1 Candidate A is called Martin in Highhouse’s article and quality  $q$  is “promotability”.

Because in the first choice set, loss aversion (in comparison with the reference candidate  $C_1$ ) was triggered in the case of candidate B but not candidate A, PT predicts that candidate A will be picked more often. Similarly, because in the second choice set, loss aversion (in comparison with the reference candidate  $C_2$ ) was triggered in case of candidate B but not candidate A, PT predicts that candidate A will be picked more often. Indeed, choices of candidate A over candidate B were significantly more prevalent in the second choice set in Highhouse (1996), thus supporting PT (for similar studies with comparable results see Slaughter *et al.*, 1999; Slaughter, 2007).

Similar results in a different context are reported by Bonaccio and Reeve (2006). In their study participants picked preferred options (jobs, plane tickets, parking permits and video cameras) in decision tasks with a similar structure as used in Highhouse (1996). Again, in line with PT's predictions, participants had a tendency to prefer alternatives that were slightly better in one respect than a reference alternative and equally good in another respect as the reference alternative over alternatives that were considerably better in one respect than the reference alternative but worse in another respect than the reference alternative.

## MATERIALS AND METHOD

### Participants

Based on the two reference points, two versions of questionnaire – A and B – were constructed to be compared to each other. Both survey questionnaires were divided into two parts: resort issues and demographics issues. Each of the questionnaires contains three questions about preferences among destinations offered with an additional question about the decision weight of the four factors (price including accommodation, ski pass and transportation costs, ski slope kilometers, the distance from accommodation to ski slopes and the distance from the Czech Republic to the final destination). The questionnaires included questions such as gender, age and profession. Regrettably, the overwhelming majority did not fill this data so we did not add an additional survey to our findings so we restricted our respondents simply to both groups of ski devoted individuals.

A total of 646 participants completed an online survey. The participants were divided into two groups, Group A ( $n = 332$ ) and Group B ( $n = 314$ ). In the group A which were internet respondents,

four hundred twenty-six people were contacted via email and internet site <http://www.vyplnto.cz>, out of which 332 responses were collected (78 percent response rate for the A questionnaire). The group B was selected from the PUXtravel contacts database and was sent the link to the online survey. Out of a random sample of 1500 PUXtravel customers surveyed, 314 participated in the survey (21 percent response rate). Participants in Group A indicated their preferences in two decision tasks 1a, 2a (see below), participants in Group B indicated their preferences in two remaining decision tasks 1b, 2b (see below) – i.e., we used a between-subjects design.

### Design of the decision tasks and predictions

Our hypothesis is that the shift of the reference point will cause a change of preferences for a service, namely a winter holiday. To test this hypothesis we created two sets of decision tasks and the choices in these two sets of tasks were compared.

In Tab. I we present the four decision tasks that were included in the survey. In all decision tasks the participant had to select his or her preferred ski tour among three alternatives (the alternatives are named after the names of the respective hotels).

The four dimensions used in the descriptions of options are: the price of the ski tour, ski slope kilometers, the distance from accommodation to the ski slope, and the distance from the Czech Republic to the final destination. As can be seen in Tab. I, in some cases precise information about the options was given, sometimes, however, the provided information was approximate only (i.e. a range of numerical values was given). The approximate values were used to ensure that all the options were perceived as equivalent with respect to the dimension where the approximate specification was used.

To test our hypothesis, we compared the choices in Task 1a vs. Task 1b; and in Task 2a vs. Task 2b, as described below.

Notice that when you look at these pairs of tasks in Tab. I (e.g. Task 1a and Task 1b), there are two options that are available in both tasks in a given pair (e.g. option “Steuer” and option “Foret Blanche” in Tasks 1a and 1b). The third option in a task is always different across the paired task (for example, in Tasks 1a and 1b, the third option is “Musik” and “Antares”, respectively). This third option serves as the reference point<sup>2</sup>.

<sup>2</sup> Note, however, that the three available options were presented to the respondents in the same manner.

## I: Decision tasks used in the study

Task	Option	Price (CZK)	Ski slope (km)	Distance to ski slope (km)	Distance from CZ to the destination (Austria vs. France)
Task 1a	Steuer (O1)	11810	100–200	0.5	Close (A)
	Foret Blanche (O2)	9580	100–200	0.5	Distant (F)
	Musik (RO)	12300	100–200	0.5	Close (A)
Task 2a	Promberg (O1)	10130–11800	130	3	Close (A)
	Croisette (O2)	10130–11800	160	3	Distant (F)
	Planger (RO)	10130–11800	48	3	Close (A)
Task 1b	Steuer (O1)	11810	100-200	0.5	Close (A)
	Foret Blanche (O2)	9580	100-200	0.5	Distant (F)
	Antares (RO)	11810	100-200	0.5	Distant (F)
Task 2b	Promberg (O1)	10130–11800	130	3	Close (A)
	Croisette (O2)	10130–11800	160	3	Distant (F)
	La Combe d'Or (RO)	10130–11800	88	3	Distant (F)

Note 1: In the “Option” column O1 stands for Option 1, O2 stands for Option 2 and RO stands for reference option.

Note 2: In both questionnaires related to respondent groups A and B the first multiple questions corresponding to three different ski resorts were the slope length specified by the comment: For all resorts hold: medium-sized ski resort (ski slopes 100-200 km); the distance from accommodation to ski slope to 500 meters. The spread of ski slope length was difficult to specify more in details due to considerable variability of this parameter done by various possibilities of ropeways use.

Let us first briefly compare the two options available in a given task, ignoring the third “reference” option. In all cases, the two options are identical with respect to two variables (e.g. “Ski slopes” and “Distance to ski slope” in Tasks 1a/1b) and such variables can be ignored in the comparisons. In all cases, one option in a given Task exceeds the other option in one attribute and, conversely, is worse than the other option in another attribute. Namely, in Tasks 1a/1b, Steuer is worse with respect to “Price” than Foret Blanche, but it is better with respect to “Distance from CZ”. In Tasks 2a/2b, Promberg is worse with respect to “Ski slopes” than Croisette, but it is better with respect to “Distance from CZ”.

Now, how does introducing the third option (the “reference” option) affect the comparison between the first two options? This is the key question for the present research.

Let us first consider the situation in Tasks 1a and 1b.

In Task 1a, Option 1 (Steuer) is better than the reference Option (Musik) with respect to “Price”, and it is the same as the reference Option with respect to “Distance from CZ”. Again in Task 1a, Option 2 (Foret Blanche) is better than the reference Option (Musik) with respect to “Price”, and it is

worse than the reference Option with respect to “Distance from CZ”.

In Task 1b, Option 1 (Steuer) is better than the reference Option (Antares) with respect to “Distance from CZ”, and it is the same as the reference Option with respect to “Price”. Again in Task 1b, Option 2 (Foret Blanche) is better than the reference Option (Antares) with respect to “Price” and it is the same as the reference Option with respect to “Distance from CZ”.

According to PT, the introduction of the reference Option Musik in Task 1a should trigger loss aversion when the reference point is compared with Option 2 (Foret Blanche). The introduction of the reference Option Antares in Task 1b does not trigger any loss aversion when compared to either Option 1 (Steuer) or Option 2 (Foret Blanche). Thus, PT’s prediction is that Option 2 (Foret Blanche) will be chosen less frequently in Task 1a (where loss aversion is triggered) than in Task 1b, compared to Option 1 (Steuer)<sup>3</sup>.

The comparisons and theoretical predictions from the previous three paragraphs are summarized in Tab. II, along with similar comparisons and predictions for Tasks 2a/2b. As can be seen in Tab. II, in case of Tasks 2a/2b loss aversion is triggered only for Option 2 in Task 2a, therefore

3 More precisely, the ratio “choices of Steuer (i.e. Option 1)” : “choices of Foret Blanche (i.e. Option 2)” is predicted to be higher in Task 1a than in Task 1b.

PT predicts that Option 1 (Promberg) will be chosen more frequently in Task 2a than in Task 2b, compared to Option 2 (Croisette)<sup>4</sup>.

Note: 0 in the “Comparison” columns means that the respective Option and its reference option are the same with respect to a given variable, + means that the Option is better than the reference option, - means that the Option is worse than the reference option.

## RESULTS AND DISCUSSION

Tab. III gives the number of participants choosing a given Option in a given Task.

As for Task 1, according to PT, Option 2 (Foret Blanche) is “handicapped” by loss aversion due to

its comparison to the reference option (Musik) in Task 1a, but not in Task 1b (where the reference option is Antares, see Tab. II).

This “handicap” is predicted to make Option 2 less popular compared to Option 1 as we move from Task 1b to Task 1a. This is indeed what we observe. The ratio of choosing Option 2 to choose Option 1 is 177: 130 in Task 1a, while it increases to 214: 62 in Task 1b (see Tab. III).

We used multinomial logistic regression to analyze these differences (Wang R. 2018, Li H. 2011 and Li G. 2015), results can be found in Tab. IV. Option 2 (Foret Blanche) has  $\exp(0.9302) \doteq 2.54$  times higher odds of being picked over Option 1 (Steuer) in Task 1b than in Task 1a<sup>5</sup>. This difference is significant at  $p < .001$ .

### II: Comparisons of options with different reference points, and the corresponding PT's predictions

Task	Option	Comparison of the Option with the reference point used in the Task with respect to:				Loss aversion triggered for the Option?
		Price	Ski slopes	Distance to ski slope	Distance from CZ	
Task 1a	Option 1	+	0	0	0	No
	Option 2	+	0	0	-	Yes
Task 1b	Option 1	0	0	0	+	No
	Option 2	+	0	0	0	No
Task 2a	Option 1	0	+	0	0	No
	Option 2	0	+	0	-	Yes
Task 2b	Option 1	0	+	0	+	No
	Option 2	0	+	0	0	No

### III: Number of participants choosing individual Options

Task	Option	Participants choosing that option
Task 1a	Option 1 (Steuer)	130 (39.2 % of Group A)
	Option 2 (Foret Blanche)	177 (53.3 % of Group A)
	Option 3 (Musik)	25 (7.5 % of Group A)
Task 1b	Option 1 (Steuer)	62 (19.7 % of Group B)
	Option 2 (Foret Blanche)	214 (68.2 % of Group B)
	Option 3 (Antares)	38 (12.1 % of Group)
Task 2a	Option 1 (Promberg)	112 (33.7 % of Group A)
	Option 2 (Croisette)	167 (50.3 % of Group A)
	Option 3 (Planger)	53 (16.0 % of Group A)
Task 2b	Option 1 (Promberg)	62 (19.7 % of Group B)
	Option 2 (Croisette)	236 (75.2 % of Group B)
	Option 3 (La Combe d'Or)	16 (5.1 % of Group B)

4 More precisely, the ratio “choices of Promberg (i.e. Option 1)” : “choices of Croisette (i.e. Option 2)” is predicted to be higher in Task 2a than in Task 2b.

5 The third value of the dependent variable is choosing neither Option 1, nor Option 2.

## IV: Results of multinomial logistic regression model

Task	Coefficient	Estimate	Std. Error	z value	p-value
Task 1	Intercept	0.2086	0.1155	2.672	0.00754
	Loss Aversion	0.9302	0.1848	5.034	4.8·10 <sup>-7</sup>
Task 2	Intercept	0.3995	0.1221	3.271	0.00107
	Loss Aversion	0.9372	0.1878	4.989	6.06·10 <sup>-7</sup>

A similar comparison can be made in the case of Task 2. Once again, Option 2 (Croisette) is handicapped by loss aversion due to its comparison to the reference option (Planger) in Task 2a, but not in Task 2b (where the reference option is La Combe d'Or, see Tab. II). According to PT, Option 2 should, therefore, become less popular when compared to Option 1 as we move from Task 2b to Task 2a. Our data again support this prediction. The ratio of choosing Option 2 to choose Option 1 is 167: 112 in Task 2a, while it increases to 236 : 62 in Task 2b (see Tab. III).

Multinomial logistic regression shows that Option 2 (Croisette) has  $\exp(0.9372) \doteq 2.55$  times higher odds of being picked over Option 1 (Promberg) in Task 2b than in Task 2a<sup>6</sup>. This difference is significant at  $p < .001$ .

To summarize, the results show that including different reference options in the choice set influences riskless choice between the other options in the choice set. Moreover, the decisions are affected in the direction predicted by loss aversion – specifically, alternatives that compare unfavorably to a reference option are chosen less often than alternatives that compare favorably to a reference option. In addition, in both tasks the effect of loss aversion causes approximately 255 % increase in odds of picking Option 2 over Option 1.

Our findings are in line with previous findings that show the effect of loss aversion and changing reference points on riskless choice (such as Kahneman *et al.*, 1990; Highhouse, 1996; Bonaccio and Reeve, 2006; Slaughter, 2007). We demonstrate further generalizability of the effect of loss aversion and reference dependence.

Much of the previous research on riskless choice employed relatively simple (and often

“artificial”) decision tasks stripped of any unnecessary features. This approach enhances internal validity through more rigorous control over the experimental situation, but it makes the generalizability of the findings to the “outside” world problematic. In our view, simple theory testing (for which rigorous experimental control, albeit in an abstracted environment, is critical) is currently less interesting in the case of PT than evaluating PT's generalizability to various decision contexts and to the field.

We base our decision tasks on real offers of winter holidays from an actual travel agency. In many respects, the decisions made in these tasks are very similar to actual decisions made by people when purchasing a winter holiday. The quasi-real-life character of the decision tasks we employ is a strong suit of the present research. Our approach goes hand in hand with a more general tendency in experimental economics to pay greater attention to ecological validity and to gather field or at least field-like data (see e.g. List, 2006; Levitt and List, 2007; Ball *et al.*, 2012).

From a marketer's perspective, we can conclude that the use of certain principles of PT (loss aversion and reference dependence) in how the set of offered options is composed can affect customer's choice.

In the real marketplace there is usually an abundance of (often only partially visible) reference points, which renders analysis of choices in the field difficult. Therefore, our data are not collected from a real marketplace, but from a hypothetical choice experiment. However, there is in fact no indication that it is the hypothetical nature of the decisions that underlie our results.

6 The third value of the dependent variable is choosing neither Option 1, nor Option 2.



## CONCLUSION

This paper has explored the effect of loss aversion and changes of reference points in a hypothetical choice experiment in microeconomic consumption behavior. We confirm that people tend to prefer alternatives that do not compare unfavorably to other options in the choice set (i.e. people are loss averse). We also confirm that the evaluation of alternatives is reference dependent: by adding different alternatives to a choice set the relative (mutual) attractiveness of the remaining alternatives can be reversed (e.g., A is chosen over B in a choice set including C1, but B is chosen over A in a choice set including C2).

The choice tasks we employed were based on real offers from an actual travel agency. This enhances the external validity of our findings that in general the role of the reference point and loss aversion has a significant impact on the consumer's behavior. Thus, our results suggest the possibility of a relatively simple and practical application of prospect theoretical principles in marketing campaigns. We expect that our findings might be added to a growing body of literature on using the prospect theory for understanding and predicting consumer's behavior.

However, with small sample size, caution must be applied, as the findings might not be transferable to all conditions. Another significant limitation that needs to be considered is the survey method used. The results are not captured from the real marketplace; the only likely choice was made. When making an actual decision, the respondents might act differently than stated in the questionnaire.

## REFERENCES

- BALL, L. J., BARDSLEY, N. and ORMEROD, T. 2012. Do preference reversals generalise? Results on ambiguity and loss aversion. *Journal of Economic Psychology*, 33(1): 48–57.
- BONACCIO, S. and REEVE, C. L. 2006. Consideration of preference shifts due to relative attribute variability. *Organizational Behavior and Human Decision Processes*, 101(2): 200–214.
- FOX, S. and DAYAN, K. 2004. Framing and risky choice as influenced by comparison of one's achievements with others: The case of investment in the stock exchange. *Journal of Business and Psychology*, 18(3): 301–321.
- HERNE, K. 1997. Decoy alternatives in policy choices: Asymmetric domination and compromise effects. *European Journal of Political Economy*, 13(3): 575–589.
- HIGHHOUSE, S. 1996. Context-dependent selection: The effects of decoy and phantom job candidates. *Organizational Behavior and Human Decision Processes*, 65(1): 68–76.
- HUBER, J., VISCUSI, W. K. and BELL, J. 2008. Reference dependence in iterative choices. *Organizational Behavior and Human Decision Processes*, 106(2): 143–152.
- JEHLE, G., and RENY, P. J. 2001. *Advanced microeconomic theory*. Boston: Addison-Wesley.
- KAHNEMAN, D., KNETSCH, J. L. and THALER, R. 1990. Experimental tests of the endowment effect and the Coase theorem. *Journal of Political Economy*, 98(6): 1325–1348.
- KAHNEMAN, D. and TVERSKY, A. 1979. Prospect theory: An analysis of decision under risk. *Econometrica*, 47(2): 263–291.
- KAHNEMAN, D. and TVERSKY, A. 1991. Loss aversion in riskless choice: A reference-dependent model. *The Quarterly Journal of Economics*, 106(4): 1039–1061.
- KNETSCH, J. L. 1989. The endowment effect and evidence of nonreversible indifference curves. *American Economic Review*, 79(5): 1277–1284.
- KNETSCH, J. L. and WONG, W.-K. 2009. The endowment effect and the reference state: Evidence and manipulations. *Journal of Economic Behavior & Organization*, 71(2): 407–413.
- KÖSZEGI, B. and Rabin, M. 2006. A model of reference-dependent preferences. *Quarterly Journal of Economics*, 121(4): 1133–1165.
- LEVITT, S. and LIST, J. A. 2007. What do laboratory experiments measuring social preferences reveal about the real world. *Journal of Economic Perspectives*, 21(2): 153–174.
- LI, H. and HUH, W. T. 2011. Pricing multiple products with the multinomial logit and nested logit models: Concavity and implications. *Manufacturing Service Operation Management*, 13(4): 549–564.
- LI, G., RUSMEVICHIENTONG, P. and TOPALOGLU, H. 2015. The d-level nested logit model: Assortment and price optimization problems. *Operations Research*, 63(2): 325–341.

- LICHTENSTEIN, S. and SLOVIC, P. 1971. Reversals of preference between bids and choices in gambling situations. *Journal of Experimental Psychology*, 89(1): 46–55.
- LINDMAN, H. 1971. Inconsistent preferences among gambles. *Journal of Experimental Psychology*, 89(2): 390–397.
- LIST, J. A. 2006. The behavioralist meets the market: Measuring social preferences and reputation effects in actual transactions. *Journal of Political Economy*, 114(1): 1–37.
- LOOMES, G., STARMER, C. and SUGDEN, R. 2010. Preference reversals and disparities between willingness to pay and willingness to accept in repeated markets. *Journal of Economic Psychology*, 31(3): 374–387.
- LUCE, R. D. 1959. *Individual choice behavior*. New York: Wiley.
- LUCE, R. D. 1977. The choice axiom after twenty years. *Journal of Mathematical Psychology*, 15(3): 215–233.
- SAMUELSON, W. and ZECKHAUSER, R. 1988. Status quo bias in decision making. *Journal of Risk and Uncertainty*, 1(1): 7–59.
- SEIDL, C. 2002. Preference reversal. *Journal of Economic Surveys*, 16(5): 621–655.
- SLAUGHTER, J. E., SINAR, E. F. and HIGHHOUSE, S. 1999. Decoy effects and attribute-level inferences. *Journal of Applied Psychology*, 84(5): 823–828.
- SLAUGHTER, J. E. 2007. Effects of two selection batteries on decoy effects in job-finalist choice. *Journal of Applied Social Psychology*, 37(1): 76–90.
- TVERSKY, A. and KAHNEMAN, D. 1992. Advances in prospect theory: Cumulative representation of uncertainty. *Journal of Risk and Uncertainty*, 5(4): 297–323.
- WONG, K. F. E. and KWONG, J. Y. Y. 2005. Comparing two tiny giants or two huge dwarfs? Preference reversals owing to number size framing. *Organizational Behavior and Human Decision Processes*, 98(1): 54–65.
- WANG, R. 2018. When Prospect Theory Meets Consumer Choice Models: Assortment and Pricing Management with Reference Prices. *Manufacturing & Service Operations Management (M&SOM)*, 20(3): 389–402.

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