Linking Loss Aversion and Present Bias with Overspending Behavior of Tourists: Insights from a Lab-in-the-Field Experiment

Quang Nguyen[1]

ABSTRACT

Building upon Prospect Theory and Hyperbolic Time Discounting models, we explore how behavioral factors influence the probability of overspending among outbound leisure travelers. We construct our data in two steps. First, we collect demographics and travel-related variables from a random sample of 314 Singaporean tourists across different age groups and income levels. Second, we conduct a field experiment to measure their risk and time preferences, specifically loss aversion and present bias. We then explore the link between the measured preferences to overspending behavior. The findings reveal an interesting link between loss aversion, present bias and traveling expenditure patterns: outbound tourists with high loss aversion and high present bias are more likely to overspend. Finally, our study also highlights the role of group identity in de-biasing. Specifically, individuals are more likely to behave according to standard economic models when making decisions in groups.

Key words: Prospect Theory; Present bias; Expectation; Over-spending; Lab-in-the-Field experiment

[1] Quang Nguyen is affiliated with Business School at Middlesex University, email: quangn@hawaii.edu

"It's all very well budgeting before you go on holiday, but much harder to do so when you are actually there."

Anonymous

INTRODUCTION

Tourism is a special kind of consumption. People have numerous expectations about planned vacations (Gnoth, 1997), and develop budget plans accordingly, prior to international travel. Thanks to the Internet and related technologies, tourists nowadays can easily form expectations about the cost of the goods and services they expect to purchase while on vacation. Yet, it is possible that the actual cost of those goods and services will be higher than expected. If this happens – and tourists adhere to their original plans to purchase the desired goods and services – they will exceed their planned budgets. On the other hand, not purchasing them can lead to feelings of loss and disappointment from unmet, pre-travel expectations. Hence, loss aversion plays a key role in driving the tourist's decision about whether to purchase the desired goods to fulfill their pre-travel expectations, or avoid overspending instead.

As such, overspending behavior depends heavily on the price of the goods and services. A long this line, Nicolau (2007) stresses the importance of reference prices in the formation of price perceptions. Thaler (1980) and Erdem, Mayhew and Sun (2001), along with many other researchers, have found that reference prices have a consistent and significant impact on consumer behavior. For any given price, the consumers compare it with the reference price. Such a comparison leads consumers to perceive the given price as a gain or loss, depending on whether the actual price is less or greater than the reference price. One of the key concepts in this study is loss aversion, which implies that changes from reference points may be valued differently depending on whether they are gains or losses. Schmidt and Zank (2005) note that

loss aversion is an important psychological concept, which has received increasing attention in economic analysis to explain anomalies in traditional choice theory.

In tourism, the analysis of loss aversion is especially relevant because of the high-risk nature of the tourism industry (Cooper, Fletcher, Fyall, Gilbert, & Wanhill, 2008). In addition, Nicolau (2008) notes that tourism is characterized by high consumer involvement with important psychological connotations. Oh (2003) does not find evidence that asymmetric effects of price deviations exist in individuals' judgments of price perceptions, within the context of room prices of an upscale U.S. hotel. While looking at admission fees to a Texas state park, Kim and Crompton (2002) show that economic factors are better explanatory variables for perceptions of admission prices than behavioral factors. Despite the relevance of loss aversion in tourism, Nicolau (2011) notes very few studies that explore its effect on tourists' behavior. We fill this gap in the literature by examining the link between loss aversion, and overspending behavior among travellers.

Closely related to our study, Nicolau and Mass (2006) and Nicolau (2008/2011) have proposed a novel methodology to estimate the loss aversion parameters based on the Random Parameter Logit model. These studies find evidence of loss aversion among tourists, and focus on price as the reference point. Our study is relatively unique in several aspects. First, these above studies estimate the loss aversion parameter by incorporating the reference-dependent model into a Multinomial Logit Model with Random Parameters, which controls for heterogeneity. The estimation is based on structured questionnaires. Evidence in favor of loss aversion emerges when people react more strongly to price increases than to price decreases, relative to the reference price. In this study, we measure loss aversion using a lab experiment that provides participants with real stakes, giving them incentive to reveal their true preferences. In line with Nicolau's insight, we also estimate the loss aversion for each individual to incorporate consumers' heterogeneity into the modeling. Secondly, in addition

to the loss aversion parameter, we estimate the present biased parameter. This parameter plays a key role in exploring the impulsive tendency of tourists, which explains their overspending. Finally, we integrate loss aversion and present bias into a single framework to explore tourists' decision making behavior Overall, we believe that our estimation methods complement Nicolau's novel approach by incorporating behavioral factors into tourism's decision models.

Another factor that can explain overspending behavior among tourists is the desire for instant gratification. Earlier studies use exponential discounting to explain consumption behavior. Yet exponential discount rates tend to decline over time and exhibit a "present bias," or preference for immediate consumption. An equivalent definition of present bias is the tendency to exercise patience in the long-term, but demonstrate impatience in the short-term. A present biased tourist may plan to limit expenditures before travel (the long-term perspective), but may actually spontaneously discard that plan and spend more when they arrive in the destination country (the short-term perspective). Present bias may become evident in the context of tourism due to the exciting and foreign atmosphere of travel. According to Lin and Chen (2013) the fun, fantasy and social or emotional gratification related to travel might trigger an unplanned and spur-of-the-moment decision to purchase goods (McGoldrick, 1990). Despite its relevance, to our best knowledge no empirical study exists that explores whether present biased tourists are more likely to overspend. We make a novel contribution to the literature by integrating Prospect Theory and present bias preferences into a single framework, and exploring the role of loss aversion and present bias in tourists' overspending behavior.

2. METHODOLOGY

2.1. Aims of this study

Our analysis is built upon a unique data set that combines economic experiments and a travel related survey. The survey data provide us with information on demographic and travel related variables, whereas the experiment enables us to estimate behavioral parameters, including loss aversion and present bias. The advantage of experiments, relative to field and survey methods, is control. Laboratory experiments can be designed to fully manipulate all factors at all desired levels, and to match the assumptions of the analytical model being tested. Additionally, our method uses real stakes to induce real incentives, a strength of our study relative to hypothetical choices utilized in other studies. Croson, Schultz, Siemsen and Yeo (2013) note that real incentives motivate participants to pay more attention; the resulting behavior may be less noise. Furthermore, decisions that involve risk – which typically happen with tourists – are likely influenced by real incentives.

Regarding theoretical framework, like Nicolau and Mass (2006) and Nicolau (2008/2001), we apply Prospect Theory (PT) instead of expected utility theory (EU), which is the standard model in the literature. These studies highlight that the PT framework is especially relevant to the study of tourism because it captures loss aversion, which is prevalent in the industry, as highlighted above. In EU, risk preferences are characterized solely by the concavity of a utility function for money. But if risky choices are expressions of prospect theory preferences (Kahneman & Tversky, 1979), then utility concavity is not the only parameter influencing risk preferences; nonlinear weighting of probabilities, and aversion to loss compared to gain, also influence risk preferences. Our instruments are designed to measure all three parameters in prospect theory – especially the loss aversion parameter – rather than just one parameter as in EU. The loss aversion parameter plays a key role in our analysis.

Another methodological contribution of this study is that it jointly estimates loss aversion and present bias parameters using the simulated maximum likelihood. This approach to measure behavioral parameters – using incentivized choice experiments – complements and improves upon other traditional methods of measuring behavioral variables, such as self-reported or hypothetically stated preferences.

2.2. Methodological approach

We use a unique data set that combines economic experiments and a survey. Specifically, we recruited a random sample of 314 tourists from different age groups, and education and income levels. We focused on holiday and leisure tourists, and not on business travelers. Additionally, we recruited tourists, whose last outbound travel occurred within the previous 12 months, coinciding with the time period in which we conducted the survey and the experiment. We proceeded with the data collection in two steps. In the first step we collected the tourists' demographic and travel related information. While there are many different types of tourist spending, we focus on shopping expenditures in the destination country.

To measure the Prospect Theory and present bias parameters, we conducted a risk and time preferences experiment with these same tourists. Our experiment design is built upon Tanaka, Camerer and Nguyen (2010). We present the details of the experiment design in Appendix 2.

2.3. The risk preferences experiment

As mentioned, we apply Prospect Theory as a theoretical framework to measure risk and loss aversion parameters. Following Tanaka et al. (2010), we use cumulative prospect theory (Tversky & Kahneman, 1992) and the one-parameter form of Prelec's (1998) axiomatically-derived weighting function as follows:

$$U(x,p;\ y,q)=\begin{cases} v(y)+\pi(p)\big(v(x)-v(y)\big) & \text{for} \quad xy>0 \text{ and } |x|>|y| \\ v(y)+\pi(p)v(x)+\pi(q)v(y) & \text{otherwise} \end{cases}$$

$$\text{where } v(x)=\begin{cases} x^{\sigma} & \text{for } x>0 \\ -\lambda(-x^{\sigma}) & \text{for } x<0 \end{cases}$$

$$\text{and} \quad \pi(p)=\exp\left[-(-\ln p)^{\alpha}\right]$$

$U(x,p;\ y,q)$ is the expected prospect value over binary prospects, consisting of the outcome x with the probability p, and the outcome y with the probability q. $v(x)$ denotes a power value function, σ represents concavity of the value function, λ represents the degree of loss aversion and α is the parameter of the probability weighting function as seen in Prelec (1998). The weighting function is linear if $\alpha=1$, as it is in EU. If $\alpha<1$, the weighting function is an inverted S-shape, where individuals overweight small probabilities and underweight large probabilities. If $\alpha>1$, the weighting function is S-shaped, where individuals underweight small probabilities and overweight large probabilities. We use Prelec's (1998) weighting function because it is flexible enough to accommodate both cases, and has fit previous data reasonably well.

To measure the above Prospect Theory parameters, each tourist was asked to choose between two options – A or B – under 35 different scenarios. Each option characterizes a prospect, including monetary rewards and the corresponding probabilities of receiving those rewards. For example, in one case the tourists were presented with the following scenario: "You have to choose between two options, A and B. These options are both gambles. If you choose A, you have a 30% chance of getting $20 and a 70% chance of receiving $5. Or you could choose Option B. If you choose B, you have a 10% chance of getting $34 and a 90% chance of receiving $2.50. Do you prefer Option A or Option B?" We remind the tourists that no

right answer exists; rather it is simply a matter of personal preference. After all of the tourists finished the experiment, we randomly selected four of them to participate with real payments.

2.4. Experiment to measure the present bias parameter

Regarding the present bias parameter, we apply Laibson's (1997) elegant (β, δ) "quasi-hyperbolic" discounting model, where $0 < \delta < 1$ is the exponential discount factor, and $0 < \beta < 1$ is the present bias parameter. According to this framework, current consumptions get a weight of one, and future consumptions receive a weight of $\beta\delta^t$.

To measure the present bias parameter β, we asked the tourists to make a long series of choices between small rewards received immediately, and larger rewards received at some later time (see Table D in the Appendix 2):

Option A: Receive x dollars today. [2]

Option B: Receive y dollars in t days.

This battery of pair wise choices permits estimation of a clever three-factor model developed by Benhabib, Bisin and Schotter (2004) and Tanaka et al. (2010).

2.5. Empirical methodology

In this section, we discuss the methodology employed in the paper. The dependent variable is "overspending." We define this variable as follows. In the survey, we ask the tourist participants for their planned, allocated budgets for shopping expenditures in their destination countries. Given that shopping in another country is risky and might be expensive, all of our

[2] It is worth noting that participants with less liquidity constraint may be more willing to wait for a greater payment. We use a number of different variables to take this phenomenon into account, such as income to control for liquidity constraint.

tourist participants indicated they had a spending plan prior to traveling. This falls in line with Kozak (2010), who notes that tourists have expenditures budgeted much earlier because allocating time for vacation is an expensive leisure activity. All tourist participants used some form of a paper or digital diary to record expenditures, lending strength to this study. These diaries enable tourists to recall their budget plans as well as their actual expenditures (Mak, Moncur & Yonamine, 1977; Breen, Bull & Walo, 2001). Based on the tourist's budget plan and the actual shopping expenditures, we define the overspending variable as follows:

$$Overspending = 1\left(\frac{Actual\ Spending - Planned\ Spending}{Planned\ Spending} > 0.1\right)$$

where 1 is an indicator function.

Put differently, a tourist will experience overspending if his actual shopping expenditure exceeds 110% of the planned expenditure.[3]

Next, we elaborate on the measurement of the covariates. A particular strength of this study is its use of experimental games with high stakes to measure behavioral parameters, i.e., loss aversion and present bias. Most other studies depend on other variables to proxy for behavioral parameters, however proxy variables may lead to measurement error bias Additionally, some studies use stated preferences to measure the behavioral parameters. A shortcoming of this approach is that it may not give as strong an incentive for the individuals to reveal preferences as our experimental games, which used very real and very high stakes.

[3] We also consider different comparisons (100%, 105%, 120%) between actual and planned shopping expenditures to define overspending. The results are consistent with what we report in this study.

Having said that, one aspect that has not been addressed thus far relates to unobserved heterogeneity. To accommodate unobservable heterogeneity in the preference parameters and observable heterogeneity in characteristics of individuals, we apply the Maximum Simulated Likelihood (MSL) approach (Train, 2003). Specifically, we consider the possibility that there is unobserved heterogeneity in preference parameters, such that they are better characterized as distribution. For simplicity, we assume that the distribution is multivariate normal. Then we can estimate the behavioral parameters – including the loss aversion λ and present biased parameters β for each individual – by generating R simulations[4] of values of $\{\lambda, \beta\}$. We then use the estimated parameters to explore their effect on tourists' overspending behavior. Detailed derivation is available upon request.

Another noteworthy aspect of our study is that we apply the two-steps model approach to study the correlation between behavioral parameters and the overspending tendency. In the first step, we estimate behavioral parameters as discussed above. We then use these estimated parameters as covariates in a standard probit model of overspending:

$$\Pr_i^{overspending} = \Phi\left(\alpha_0 + \xi X_i + a_1 \hat{\lambda}_i + a_2 \hat{\delta}_i + a_3 \hat{\gamma}_i + a_4 \hat{\beta}_i\right)$$

where $\Pr_i^{overspending}$ is the probability for tourist *i* to experience overspending

$\Phi(\ )$ is the standard normal cumulative distribution function and

X_i is the tourist's demographic characteristics including age, gender, income, travel duration, mode of payment and other related travelling variables.

[4] We apply the same procedure used in Train (2003) and Andersen et al. (2008) to draw random sequences in order to ensure good coverage of the intended density with minimal R. This makes it feasible to undertake the simulated maximum likelihood for a small-dimensional data set.

$\hat{\lambda}_i$, $\hat{\sigma}_i$, $\hat{\gamma}_i$, $\hat{\beta}_i$ represent the tourist's loss aversion, risk aversion, probability weighting function and present bias parameters. They are estimated using the maximum simulated likelihood (MSL) approach in step 1.

As Murphy and Topel (1985) note, the two-steps model gives consistent estimates of the parameters in the overspending equation; however, the standard errors are underestimated in most previous studies using this approach. This is primarily because those studies do not take into account that the parameters in the first step are also estimated, and thus contain errors. In the context of our study, there is a sampling error in the estimation equation for each preference parameter. We apply the approach of Murphy and Topel (1985) by integrating sampling errors from estimation of behavioral parameters into the estimation of overspending. Doing so, we yield a correct covariance matrix, which allows for correct hypothesis testing, and inferences of the overspending equation.

3. RESULTS WITH DISCUSSIONS

We first apply the structural approach to estimate the Prospect Theory and present bias parameters for the tourist participants. Due to the potential difference between students and other participants, we present the statistics for the whole sample, as well as for the student sample. Table 1 presents the main results of the estimation. Overall, we can see that the results are consistent between the two samples. To check whether the participants are more likely to behave according to prospect theory, we conduct the following hypothesis testing - Ho: $(\lambda, \gamma, \beta) = (1, 1, 1)$. The χ^2 statistics for this test is 28.81, which corresponds to p-value less than 1% ($\chi^2 = 28.81, p < 0.01$). As such, the data are not likely to be supported

by the standard expected utility and exponential time discount, but rather by prospect theory and present bias preferences.

3.1. Summary statistics

Table 2 presents the descriptive statistics of the key variables. There is a good balance of male and female respondents; the majority of both were still pursuing education at the university level. Regarding income level, a large number of our total respondents fall into the $2,001 - $5,000 income range. A majority also engaged in pre-travel research about their destination countries. Most visited Asia or Southeast Asia, likely because of the proximity to the origin country for the purpose of a short trip, which ranks as the third most important factor for tourists in selecting a destination country.

Regarding the reasons for selecting the destination country, our respondents were most concerned with food and shopping during travel. Shopping malls and restaurants ranked first and second respectively for the most visited places. In fact, food and shopping ranked second overall for choosing the destination country. Shopping malls were the second most researched aspect of visiting the destination country, while restaurants and food streets ranked fifth. Among planned and actual expenditures, food and clothing ranked first and second respectively. Table 6 presents the correlation matrix of the main variables.

3.2. Regression results

Table 3 presents determinants of overspending by tourists. We classify these determinants into three categories: behavioral factors, travel related factors and demographic variables. Regarding behavioral determinants, the key message is that loss aversion and present bias

have a positive effect on the probability of overspending. This finding implies that tourists with high loss aversion and/or high present bias are more likely to overspend. Another behavioral variable that affects overspending is risk aversion. Risk averse tourists are less likely to overspend, perhaps because they perceive shopping in another country as risky. As a result they are less willing to make purchases while on vacation. Relative to loss aversion, however, the effect of risk aversion on overspending is less significant. We test a hypothesis that the coefficient for loss aversion is equal to that for risk aversion. The F statistics for this hypothesis is 5.17, and the corresponding p-value is less than 1%. As such, we have statistical evidence to support the hypothesis that loss aversion has a greater effect on overspending than risk aversion.

Regarding the effect of demographics and travel related variables on overspending, Table 2 reveals some interesting patterns. For example, higher income tourists are more likely to overspend. This finding is consistent with the Hong, Fan and Palmer (2005) finding that a significant positive relationship exists between income, assets and leisure travel spending. Peerapatdit (2004) also shows that families with higher incomes are more likely to take a greater number of trips, and spend more per trip, compared to families with lower incomes. As expected, conducting research on the destination country prior to travel significantly reduces the likelihood of overspending. Another noticeable finding is the highly significant effect of credit card use on overspending ($\beta = 0.576$, $p < 0.008$); tourists using credit cards for travel are more likely to overspend. This finding is consistent with Prelec and Simester's (2000) finding that the effect on willingness-to-pay can increase up to 100% when the customers are instructed to pay with a credit card rather than cash; moreover, it is unlikely that this arises solely from liquidity constraints. A credit card delays the effect of the payment to a later time, and also separates the purchaser from the immediate financial impact of the purchase. This feature has an interesting implication for present biased tourists, which we discuss next.

3.3. The moderating effect of group decisions and commitment devices

To explore the moderating effect of group decisions and commitment devices, we extend the baseline probit model by incorporating the interaction effect of these variables with loss aversion and present bias. Table 4 presents the main findings.

The role of the group in moderating the effect of loss aversion and present bias

A key finding is that a group decision reduces the effect of loss aversion and present bias. The interaction effect of group decisions with present bias ($\beta = -0.238,\ p < 0.026$) and loss aversion ($\beta = -0.15$, $p < 0.078$), are both negative and significant. This finding highlights the role of group identity in de-biasing. Namely, individuals are more likely to behave according to standard economic models when making decisions in groups. In our study, the group decision occurs mostly within the context of family travel. However, it might also arise when a group of friends pool their budget and make spending decisions together. In the latter case, peer effect regarding spending may also offer an explanation for the negative moderating effect of group decisions on present bias.

Finally, it is also worth exploring whether group decisions play a stronger role in moderating the effect of loss aversion on overspending than the effect of present bias. We conduct a hypothesis, testing to compare the coefficients for the two interaction terms: one between group decision and present bias, and another between group decision and loss aversion. The F statistics for this test is 6.46, and the corresponding p-value is less than 5%. As such, the group decision has a stronger moderating effect on present bias than on loss aversion.

Present bias and digital expenditure diaries

The highly significant and negative interaction effect implies that digital diaries help present biased tourists reduce their overspending ($\beta = -0.323$, $p < 0.006$). These diaries offer a simple way to track and analyze spending. Tourists who use digital expenditure diaries are less likely to overspend. Furthermore, the diary helps keep the tourist accountable to their original budget plan, thus it helps with the self-control problem. Interestingly, the digital diaries also prove efficient in helping the tourists address impulsive spending behavior. There are several explanations. First, digital diaries are convenient to use, an important time saving factor in comparison to paper diaries. Second, tourists can download various apps from the Internet, which allow users to track their expenditures daily, and help to keep impulsive spending in check during travel. [5]

Present bias and credit card use

As discussed, tourists who use credit cards for travel are more likely to overspend. A credit card delays the impact of payment, enabling tourists to reap the benefit of immediate consumption. As such, credit cards may enhance the impulsive spending tendency among highly present biased tourists. Meier and Sprenger (2010) find that present biased individuals underestimate their borrowing tendency as a result of using credit cards. Following this insight, not using a credit card may serve the function of a good commitment device that helps present biased tourists address impulsive buying. To explore this proposition, we consider the interaction effect of present bias and not using a credit card, on overspending. As expected, we find a significant effect $\beta = -0.133$, $p < 0.048$ thus confirming our

[5] For example, this website provides some free applications for digital expenditure diaries: http://www.nerdwallet.com/blog/finance/money-nerd/budgeting-money-nerd/5-best-online-budgeting-tools/

conjecture that not using a credit card is a good strategy for tourists to adhere to their initial planed expenditure.

3.4. Relative to traditional settings:

As mentioned in the introduction, this study explores the role of loss aversion and present bias in tourism, which is characterized by two motivational structures: (1) the wish to contrast day-to-day or ordinary life routines, and (2) the wish to be out-of-place (Geuens et al., 2004). These structures may trigger impulsive buying, thus increasing the likelihood of overspending by tourists relative to traditional consumers. Hence, to overcome overspending, it is even more important for tourists to implement some form of commitment device, or "tying one's own hands," to overcome the self-control problem. The interaction effect of present bias and group decisions with digital expenditure diaries, and limited use of credit cards, implies that they are efficient commitment devices. Namely, these devices decrease the effect of present bias on the overspending tendency of tourists.

Given the relevance of such devices in the context of tourism, a natural question arises: are tourists with high levels of present bias – who are more influenced by the tendency to spend impulsively during travel – more likely to use these devices? To address this question, we run three separate probit models to explore the determinants of the use of these devices. Table 5 presents the main findings. We notice that digital expenditure diaries seem to be popular devices; tourists with high levels of loss aversion and present bias are more likely to use them. On the other hand, there is no evidence that tourists with behavioral bias are less likely to use credit cards. The result has an important implication, in line with Meier and Sprenger's (2010) finding that present biased consumers are more likely to borrow for spending.

3.5. Implications for the management of tourist operations

A unique feature of tourism, relative to other industries, is the notion of intangibility. Specifically, a service cannot be demonstrated, nor can a sample be sent to the customer prior to purchase. This feature has strong marketing implications. Our study suggests that firms can take advantage of the attachment effect to generate the customer's intention of buying certain products. For instance, a travel agency may first describe to potential tourists how many exciting places they can visit in the destination country. The description might spark a desire in the tourists, who then set the intention to travel to the destination country, thereby increasing their willingness to accept the expense of it. Along this line, we suggest some interesting avenues for future research. In particular, we wonder whether such a strategy addresses the inherent problems due to the individual nature of the tourism experience.

While our study explores the effect of expectations on tourists' overspending behavior, an interesting aspect of tourism operation relates to timeliness and time dependency. Tourists' expectations about the timeliness of product and service delivery may be conditional on context and culture; yet they still expect a good pace and rhythm of service delivery. Our theoretical framework, i.e., Prospect Theory, suggests that to ensure the tourist' satisfaction, it is crucial that operations meet their expectations. For example, ground transfer arrangements aimed to provide connections with time-bound air travel, or train schedules and related operations, must be designed to ensure that these expectations are delivered upon.

Regarding the link between present bias and tourists' behavior, our study offers several insights. We explore the role of commitment devices in moderating tourists' overspending behavior. It is well known in the literature that consumers with present bias preference look for commitment devices to address impulse buying. In the context of tourism, these devices become even more valuable, given the exciting and foreign atmosphere of travel that encourages spontaneous purchasing behavior. We find that digital expenditure diaries prove

to be efficient commitment devices, thanks to their ease of use and ability to track daily purchases. Limiting the use of credit cards also proves to be an efficient commitment device for tourists. Further studies on other forms of commitment devices and their effects on tourist behavior are worth exploring.

6 CONCLUSIONS

6.1 Summary of Key Findings

This paper aims to explore important determinants of overspending among outbound leisure travellers. We find that tourists with higher loss aversion and present bias are more likely to experience overspending. Two implications can be derived from this finding. First, this result reflects the impact of the "attachment effect" on overspending. Despite facing higher prices than expected, people will still consume the goods. This tendency is likely caused by an attachment to consuming the desired goods, which is formed prior to traveling to the destination country. Second, the stimuli and situations provided by travelling may trigger impulsive buying tendencies, hence enhancing the effect of present bias on overspending. Other variables including income, mode of payment and pricing, can also explain overspending behavior, though not as significantly.

6.2 Suggestions for Future Research

Our study illustrates the relevance of implementing field experiments to provide further insights into tourism literature. Also, in addition to Prospect Theory and present bias preferences, researchers can explore the role of other behavioral factors in tourism decision-making. For instance, it is a well-established finding that many people have projection biased preferences when forming their travel budget; that is, the tendency for a tourist to think his

preferences won't change. However, a projection-biased tourist may underestimate the stimulating effect of the travel experience on his preferences; hence, he may underestimate the actual expenditure when planning. For example, the tourist might think he would never buy a certain local product. However, upon arrival in the destination country he might discover he actually likes that product – perhaps from the excitement of travel – and will therefore purchase it. Future research could conduct a field experiment on projection biased preferences, and explore its effect on the overspending behavior of tourists.

An interesting element worth exploring further, relates to product quality. Our study focuses on the difference between the expected and the actual price. Yet, in some cases the tourists may place a higher emphasis on the quality of the product rather than its prices (Jin et al., 2012). It could also be the case that the expected price and the actual price are not much different, though the actual quality is remarkably different from the expected quality. This point provides an important insight into tourism research. While most tourists have some idea about the prices of the products in the foreign countries, they have little information about the quality. This is simply because they cannot actually see the products. It is not uncommon to observe tourists' satisfaction with prices of products in foreign countries, only to feel disappointed about the quality. A promising direction for future studies is to examine how the attachment effect and quality gap interactively influence consumer behavior.

Finally, our study finds that using credit cards during travel may be an important and driving factor for overspending behavior. Interestingly, we also find that present biased tourists do not limit their use of credit cards to avoid their impulsive buying behavior. A possible reason for this is that they might not be aware of their present bias, and thus lack sophistication. Future studies could explore the role of sophistication in overspending, and other behavior among tourists.

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Footnotes:

[1] An interesting phenomenon related to our study is mental accounting. Behavioral economist Richard Thaler (1999) defines mental accounting as a set of cognitive operations adopted by individuals to value each dollar differently, according to where it comes from, where it is kept and how it is spent. It provides an alternative view that humans have bounded rationality and do not treat money in a homogeneous manner. Stilley et al., (2010) provide an excellent review on the implications of mental accounting for consumer behavior.

[2] Prospect Theory is one of the most influential insights in economics. According to Google Scholar, the Kahneman and Tversky (1979) paper has more than 20,000 citations.

[3] From our survey results, we found that our respondents generally spent more of their money on food, clothes, transportation, souvenirs and local merchandise. Peerapatdit (2004) found that shopping was the second largest component of travel expenditure after lodging; tourists are more likely to spend on souvenirs for their friends and family.

[4] In our study, we excluded lodging as it is usually paid prior to the trip. Our study only covers expenditures made during travel.

[5] Alternatively, one may focuses on the traveler's overspending behavior for each item separately. The results are qualitatively consistent with those reported in the paper.

Table 1: Estimated risk and time preferences parameters using the general structural approach

	All participants	Student participants
Risk aversion (α)	0.41	0.34
Loss aversion (λ)	1.64	1.65
Probability weighting (γ)	1.60	0.72
Present bias (β)	0.83	0.86
Exponential Time discount rate (δ)	0.004	0.005
Number of participants	314	181

Statistical test results

	Ho: λ=1	Ho: γ=1	Ho: β=1
χ^2	28.81***	144***	136***

Note: *** indicates significance at the 1% level
We conducted robust regression and adjusted standard errors for correlations within individuals.

Table 2: Demographic Characteristics of Respondents (N= 314)

Demographic Characteristics		**# Of Respondents**
Gender	Male	147
	Female	167
Age	18-25	196
	26-32	58
	33-40	28
	41-55	24
	>55	8
Occupation	Student	170
	Employed/ Self-employed	123
	Unemployed	
	Housewife	0
	Retired	15
		6
Education level	Primary	4
	Secondary	11
	Junior College/ Polytechnic/ ITE	166
	University	
	Masters & above	115
		18
Gross Income Level (Working) Total – 143 respondents	$0 - $2000	24
	$2001 - $5000	90
	$5001 - $10,000	20
	$10,001 - $20,000	4
	> $20,000	4
Gross Income Level (Household) Total – 171 respondents	$0 - $2000	23
	$2001 - $5000	80
	$5001 - $10,000	53
	$10,001 - $20,000	14
	> $20,000	2

Table 3: Determinants of tourism overspending

	Coefficients		P –value
Behavioral variables			
Risk aversion	-0.233	*	0.087
Probability weighting function	0.101		0.274
Loss aversion	0.586	**	0.038
Present bias	0.358	**	0.025
Travel Details			
Duration	-0.015		0.615
Purpose of trip	-0.105		0.122
Group decision	-0.109		0.577
Research	-0.417	**	0.013
Research Time	0.011		0.774
Credit card use	0.576	***	0.008
Funded by others	0.310	**	0.035
Digital Expenditure diaries	-0.126		0.155
Satisfaction	0.158	*	0.098
Demographic variables			
Age	-0.106		0.122
Gender (Female =1, Male =0)	0.115		0.105
Income	0.238	**	0.042
Education	0.080		0.233
Constant	-0.206		0.589
Number of observations	314		
Pseudo R squared	0.235		

Note: We implement the probit model to estimate the marginal effect of the covariates on the probability of overspending.

For easy interpretation, the Present Bias variable is estimated as $1/\beta$

, **, *, Denote significance at the 10%, 5% and 1% levels respectively. Standard errors are in parentheses.*

Table 4: Moderating effect of the group decision and commitment devices

	Coefficients		**P –value**
Loss aversion	0.355	**	0.043
Present bias	0.256	**	0.033
Group decision	-0.125		0.233
Loss aversion * Group decision	0.115	*	0.078
Present bias * Group decision	0.238	**	0.026
Using credit card	0.258	**	0.035
Present bias * Not using credit card	-0.133	**	0.048
Digital expenditure diaries	-0.115		0.177
Present bias * expenditure diaries	-0.223	***	0.067
Control for demographic variables	Yes		
Control for travel related variables	Yes		
Number of observations	314		
Pseudo R squared	0.278		

Note: We implement the probit model to estimate the marginal effect of the covariates on the probability of overspending.

For easy interpretation, the Present Bias variable is estimated as $1/\beta$

, **, *, Denote significance at the 10%, 5% and 1% levels respectively. Standard errors are in parentheses.*

Table 5: Determinants of the use of commitment devices

	Group decision		Digital expenditure diaries		Limited use of credit card
Behavioral variables					
Loss aversion	0.115		0.233	**	0.078
Present bias	0.238	**	0.257	**	- 0.122
Control for Travel related variables	Yes		Yes		Yes
Control for Demographic variables	Yes		Yes		Yes
Number of observations	314		314		314
Pseudo R squared	0.17		0.21		0.16

Note: We run the probit models for each of the devices: group decision, digital expenditure diaries, and limited use of credit card.

The coefficients represent the marginal effects.

For easy interpretation, the Present Bias variable is estimated as $1/\beta$

, **, *, Denote significance at the 10%, 5% and 1% levels respectively. Standard errors are in parentheses.*

Table 6: Correlation between variables

	Travel with	Research	Research Time	Mode of Payment	MA Budget	Source of Expditure
Travel with	1.0000					
Research	-0.0569 (0.3147)	1.0000				
Research Time	-0.0577 (0.3083)	0.6487 (0.0000) ***	1.0000			
Mode of Payment	0.0030 (0.9582)	0.0216 (0.7034)	-0.0805 (0.1548)	1.0000		
MA Budgeting	-0.0115 (0.8385)	0.1171 (0.0381) **	0.0109 (0.8481)	0.1798 (0.0014) ***	1.0000	
Source of Expenditure	-0.0063 (0.9120)	-0.1126 (0.0390) **	-0.1166 (0.0390) **	0.2896 (0.0000) ***	0.0176 (0.7559)	1.0000
Prices	-0.0326 (0.5654)	-0.0216 (0.7026)	0.0060 (0.9161)	0.0835 (0.1397)	-0.0597 (0.2915)	0.0502 (0.3756)
Mental Accounting	-0.0662 (0.2419)	-0.0216 (0.7026)	-0.0248 (0.6621)	0.2478 (0.0000) ***	0.1021 (0.0707) *	0.0914 (0.1061)

*Notes: *, **, ***, denote significance at the 10%, 5% and 1% levels respectively. Standard errors are in parentheses.*

Figure 1: Demographics of Respondents – Highest Level of Education

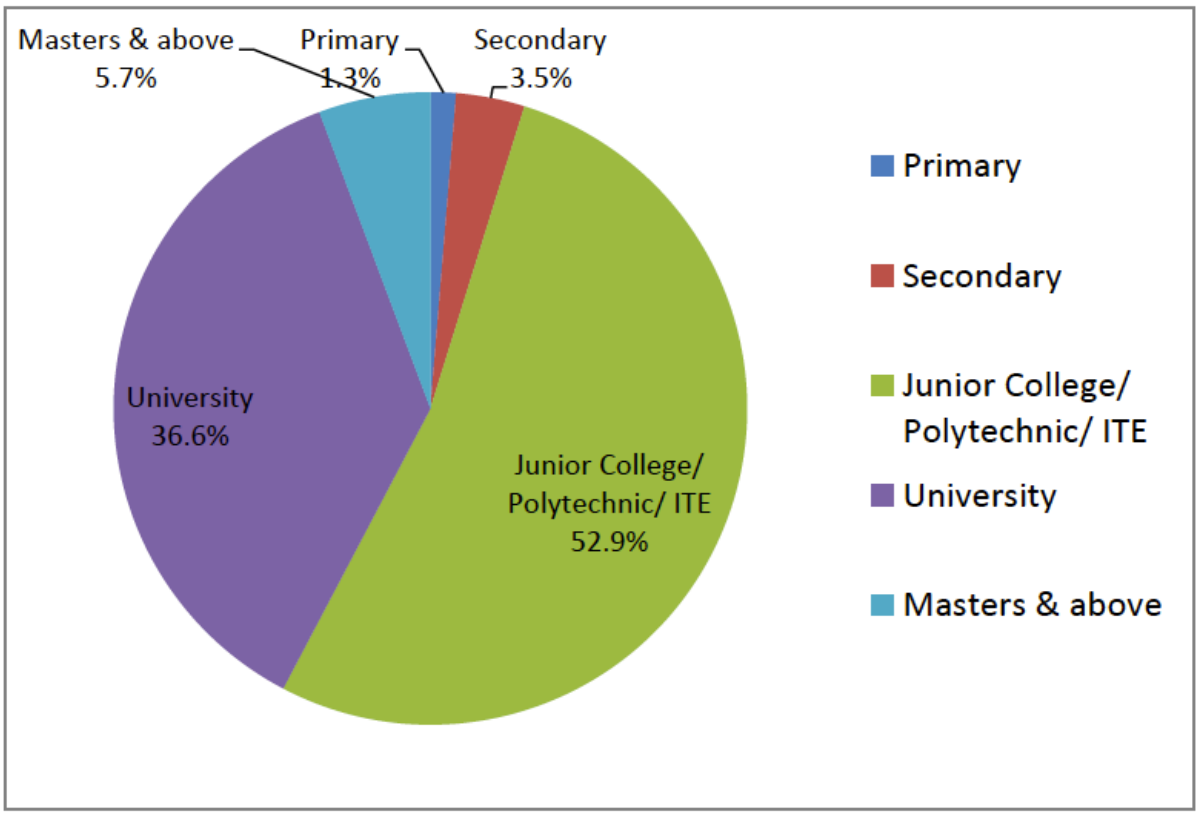


Figure 2: Demographics of Respondents – Income Level

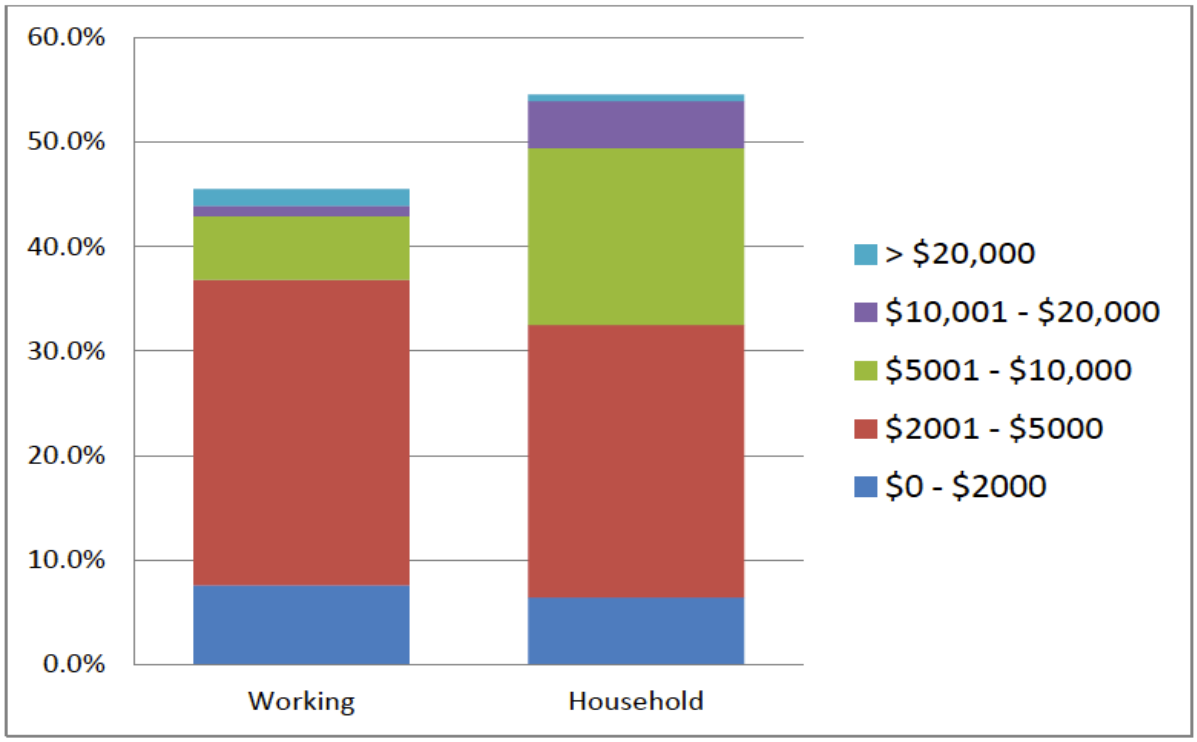
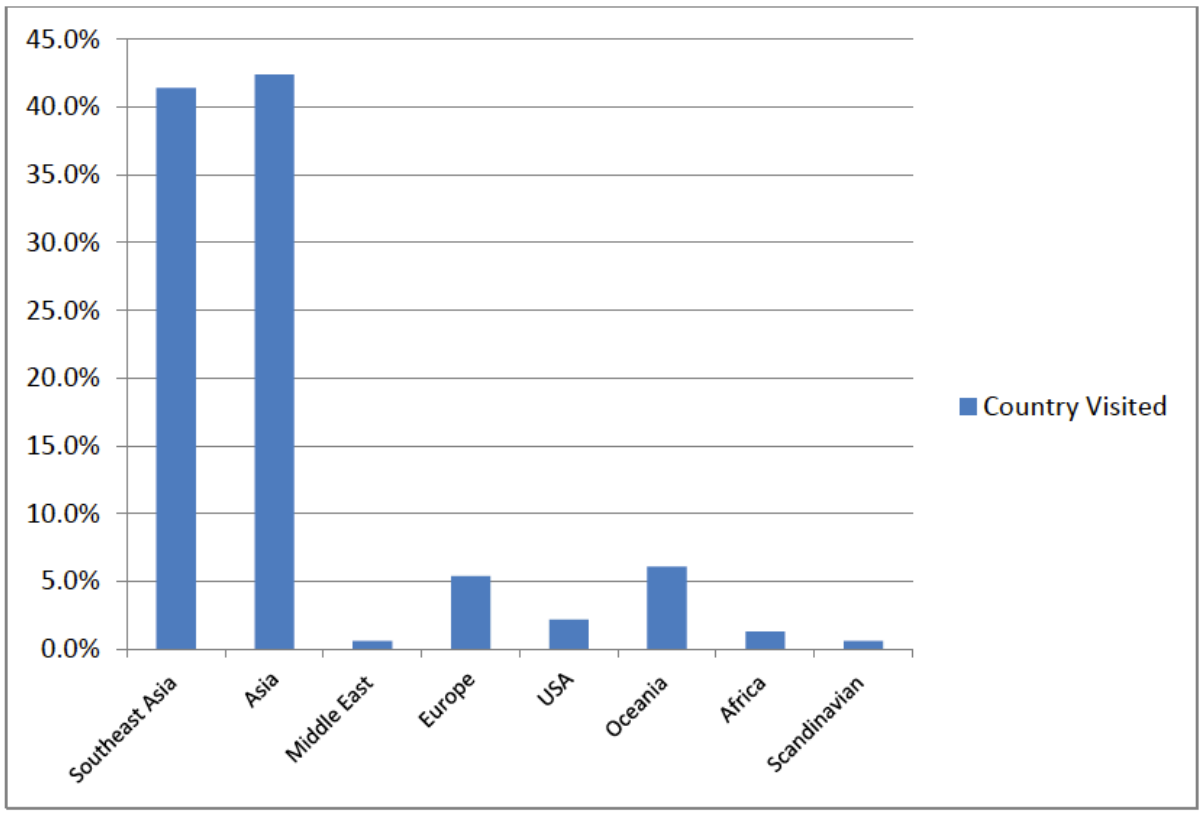


Figure 3: Outbound Departures of Singapore Residents by Destination Country



Source: Singapore Tourism Board (2012)