1-2019

Evaluating Myopic Loss Aversion of Forestland Owners

Mustapha Alhassan
Clemson University

Marzieh Motallebi
Clemson University, mmotall@clemson.edu

forests

MDPI

Article

Evaluating Myopic Loss Aversion of Forestland Owners

Mustapha Alhassan [1,2,*,†] **and Marzieh Motallebi** [1]

1 Baruch Institute of Coastal Ecology and Forest Science, Clemson University, P. O. Box 596, Georgetown, SC 29442, USA; mmotall@clemson.edu
2 United States Geological Survey, Science and Decisions Center, 12201 Sunrise Valley Drive, Mail Stop 913, Reston, VA 20192, USA
* Correspondence: malhassan@usgs.gov; Tel.: +1-703-648-5754
† Mustapha Alhassan contributed to this research in his personal capacity while at Clemson University as a Post-Doctoral Research Associate. The views expressed are his own and do not represent the views of the U.S. Geological Survey or the United States Government.

Received: 28 November 2018; Accepted: 17 January 2019; Published: 24 January 2019

check for updates

Abstract: Attracting forestland owners to participate in carbon markets can be challenging for several reasons including offset price volatility, legislative uncertainties, high costs of offset project development, long contract lengths, and landowners' risk preferences. In this article, we elicit risk preferences and investigate Myopic Loss Aversion (MLA) of forestland owners using an economic experiment. The economic experiment is a betting game and we find that forestland owners exhibit MLA because they bet higher when returns from their investments are evaluated less frequently. Our results provide valuable information for developing carbon market protocols, especially in setting optimal evaluation periods of forest carbon offset projects.

Keywords: carbon markets; forestland owner; myopic loss aversion; risk preferences

1. Introduction

Combating anthropogenic climate change and its impacts has led to enactment of carbon emissions trading (cap-and-trade programs), a market-based approach to reduce greenhouse gas (GHG) emissions in the atmosphere. Examples are the California's cap-and-trade program (CA-CTP) under the Western Climate Initiative, the European Union's and New Zealand's emissions trading schemes. In the CA-CTP, a carbon market is established to promote carbon sequestration from many sectors including the forest sector (see [1] for further discussion). Forests carbon sequestration to generate carbon credits (also known as carbon offsets) is one of the main processes by which forest owners can be incentivized to help reduce GHGs in the atmosphere. It is an emerging opportunity for forestland owners. Additionally, demand for forests carbon offsets across the United States is likely to increase as the CA-CTP expands. In 2016, forestry and land use comprised about 46% of the total value of voluntary carbon markets globally, and supplied 13.1 million tons of carbon dioxide equivalent ($MtCO_2e$) traded at an average price of $5.1 per tCO_2e [1]. However, forestland owners' decision to participate in carbon markets is a risky business due to offset price volatility, legislative uncertainties, high costs of offset project development, and long contract lengths; making landowners' risk preferences an important determinant of their decisions.

This paper focuses on risk preferences of forestland owners, which we assume can be impacted by returns from investment in carbon markets, offset price fluctuations, and protocols in carbon markets including offset projects evaluation periods. Even though the price of carbon offset under the CA-CTP, in particular, is predicted to increase by more than three times the current price, to about $35 per tCO_2e

by 2020 [2], offset price has the tendency to behave like a stock price, and fluctuates daily with no minimum guarantees. Instability in the price of carbon offset may affect forestland owners' financial investment decisions, especially with respect to participation in carbon markets.

A wealth of research exists on investigating forestland owners' willingness to generate carbon credits from their forestlands in order to sell in carbon markets (e.g., [3–6]). Some of these studies find that willingness of private forestland owners to participate in carbon markets is low (e.g., [3,6]) alluding to some of the reasons mentioned here. There are also studies looking at forest landowners' behavior related to wildfire management and pest management [7–9]. These studies investigate behavioral determinants such as risk perceptions, probability weighting and risk preferences. However, no study to the best of our knowledge, has looked at the experimental measures of risk preferences of forestland owners and how they may affect their financial investment decisions, and consequently, their rate of participation in carbon markets. We address this information gap by investigating effects of myopia and loss aversion on risk preferences of forestland owners. Investigating forestland owners' risk preferences is important in informing policies to achieve low carbon economies through carbon markets. In addition, our findings have implications for understanding not only forestland owners' decisions under risk and uncertainty but can be applied to all natural resource management decisions, especially decisions involving resources that provide multiple benefits to owners and society at large. In this article, we elicit forestland owners' risk preferences using two different techniques: incentive compatible (economic experiment) and non-incentive compatible (questionnaire or Likert-scale).

With our experimental approach, we elicited forestland owners' risk preferences using a method proposed by Gneezy and Potters [10]. In an experimental setting, Gneezy and Potters [10] evaluated Myopic Loss Aversion (MLA) of students. MLA is dubbed by Benartzi and Thaler [11] and defined as a combination of loss aversion and frequent evaluation of investment portfolios. Thaler et al. [12] interpret MLA as a combination of two behavioral concepts, loss aversion and mental accounting. Loss aversion is greater sensitivity of an individual to losses than to gains [13], and mental accounting is the tendency to evaluate investment outcomes frequently [12]. Implications of MLA are that investors who exhibit MLA are more risk averse if they evaluate their investments more frequently, and if payoffs are higher enough to offset losses, they will accept more risk [12]. On the other hand, the questionnaire method is widely used in eliciting risk preferences and relies on individual's self-reported predisposition toward risks [14]. In the questionnaire approach, respondents are asked to rate their willingness to take risks in different domains. The problem with this approach is that responses are not incentive compatible, especially in the domain of financial decision making when participants do not receive monetary compensation [14].

In the seminal work of Gneezy and Potters [10], they confronted subjects with a sequence of 12 identical but independent rounds of lottery bets. In the first nine rounds identified as part one, each subject was endowed with 200 cents. Subjects decided part of the 200 cents, x_t (t = 1, 2, . . . , 9 rounds), they wanted to bet in the lottery for each round such that $0 \leq x_t \leq 200$. The lottery had a 2/3 probability of losing the amount bet and a 1/3 probability of winning 2.5 times the amount bet. Part two was made up of rounds 10 through 12. A subject's endowment for part two was the total of her payoffs from part one divided by three. Subjects were divided into two, high and low frequency treatments. For subjects in the high frequency treatment, a draw was made in each round for them to calculate their payoffs. The low frequency treatment subjects made bets in blocks of three such that the same bets were restricted for rounds one through three, rounds four through six, rounds seven through nine, and for rounds 10 through 12. Gneezy and Potters [10] found that the high frequency treatment subjects made lower bets compared with the low frequency treatment subjects, which they conclude supports the prediction of MLA.

In a similar study, Haigh and List [15] investigated MLA among 32 students and 27 professional traders from Chicago Board of Trade (CBOT) using Gneezy and Potters [10] approach. Each student or trader was endowed with 100 units of an asset. The exchange rate for student subjects was 1:1 (1 cent for each unit) and 4:1 (4 cents for each unit) for traders to ensure reasonable compensation for their time for participating in the experiments. They found that traders exhibit behavior consistent with MLA than students. Furthermore, in each of their experimental investigations of MLA, Thaler et al. [12] and Langer and Weber [16] found that subjects made higher bets when the frequency of evaluation periods were low, thus, supporting evidence of MLA.

Our study follows the previous literature [10,15] but differs with regard to the experimental subjects, field of application, and the analysis of our experimental data. We recruited forestland owners from the State of South Carolina to investigate MLA in the field of natural resource management. We analyze our data incorporating characteristics of forestland owners to answer important questions including what is optimal with regard to frequency of evaluation of carbon offset projects and how characteristics of forestland owners affect their risk preferences. Our results provide useful insights into policy formulation in carbon markets, especially in determining evaluation periods of carbon offset projects to encourage participation in carbon markets.

Our experimental approach assumes forest is a portfolio of investment to forestland owners and how they evaluate forests market transactions over time is crucial in their investment decisions. The questions are whether the landowners evaluate transactions frequently, individually, or as a portfolio over time? In addition, how do forestland owners frame their decisions and outcomes of their decisions? Are they framed narrowly in that a forestland owner's utility depends on returns from investment or otherwise? Knowledge of MLA of forestland owners may help answer these questions.

2. Carbon Markets and Forests Offset Projects

Carbon markets, also known as cap-and-trade programs or emissions carbon trading, are markets created from trading of carbon emission allowances among regulated entities to help reduce carbon dioxide (CO_2) emissions. In a cap-and-trade program, regulated companies are allowed to buy or sell granted allowances of CO_2 output also known as credits. The regulating body distributes a predetermined number of CO_2 credits to companies, representing the cap part. Companies can only emit CO_2 levels equivalent to the credits they have. Companies that emit below their credit limits can sell remaining credits to companies that exceed their limits, representing the trade part. There are currently carbon markets created at international, national, and at regional levels including the European Union's Emissions Trading Scheme, the Northeast Regional Greenhouse Gas Initiative, the Midwestern Regional Greenhouse Gas Reduction Accord, and the Western Climate Initiative under which the California's Cap-and-Trade Program is [17]. We used the California cap-and-Trade Program (CA-CTP) as our model example in this article.

Under the CA-CTP, regulated entities are allowed to acquire offset credits including forest offset credits from any part of the United States to offset up to 8% of their compliance obligations [18]. Eligibility rules for participating forests offset projects in the CA-CTP are provided by the forest offset protocol and allow participating forestland owners from any part of the United States to generate and sell offset credits in the carbon market (see California Air Resources Board (CARB), [19]). The minimum number of years a forestland can register with the CARB or an approved offset credit project registry such as the Climate Action Reserve is 100, with routine monitoring, reporting, and verification to ensure all credited GHG emission reductions are maintained. Offsets are issued annually based on offset project data reports, and offset credit evaluations are done every six years to ensure projects satisfy certain eligibility requirements including standing live carbon [20]. Participants in the carbon market can lose their contracts from selling carbon credits with penalties if they fail to increase or maintain recommended levels of carbon stocks [20].

3. Experimental Design and Data

To investigate evidence of MLA in preferences of forestland owners, we conducted an artefactual field experiment by recruiting private forests owners in South Carolina. Each of our experimental sessions took about 30 to 45 minutes to complete and took place at the South Carolina Forestry Commission Office and in the multi-purpose room of the Belle W. Baruch Institute of Coastal Ecology and Forest Science in September 2017. At the beginning of each session, we gave a presentation on the California's cap-and-trade program to educate forestland owners on how they can participate in selling carbon credits in the program. We then handed instructions of the experiment to each participant with a registration form for them to calculate their payoffs (returns from investments) during the experiment.

3.1. Experimental Design

The experiment had two parts (I and II) with sections A and B for each part. We mentioned to participants they would be paid cash at the end of the experiment (section B of part II) based on their total earnings. To be consistent with the extant literature, section A was made up of nine rounds and three rounds for section B. In section A, each participant was endowed with 10 units of an asset in each round, where one unit equals five cents. With 33% chance of winning three times the amount invested plus the 10 units, participants bet any amount from zero to all the 10 units and one of three colors was drawn for participants to calculate their gains/losses. The instructions for section B was the same as that of section A except that endowment for section B was made up of the total returns from section A which we indexed Gi (i = part I, II) divided by three. Draws were made for every single round in part I (of sections A and B) to represent the frequent treatment or evaluation period as in Gneezy and Potters [10].

Part II represented the infrequent evaluation period and differed from part I by rate of participants' assessment of their gains/losses. We delayed draws until participants made bets for each round in a block of three rounds: 1–3, 4–6, 7–9 and 10–12. A single bet amount was restricted to all the three rounds in each block. Draws were made simultaneously at the end of the third round of bets for participants to calculate their gains/losses for the three rounds. In each of the first nine rounds in parts I and II, a participant could earn an amount from zero to 40 units in total returns. Our exchange rate was determined from recommendations of forest consultants in South Carolina. We offered a maximum of $72 as the highest amount that could be received as a compensation for participating in the experiment given the duration. The actual amount received by participants ranged from $0 to $22. The main part of the instructions to help one understand the experiment is shown in the Appendix A.

We also elicited information on sociodemographic characteristics of participants and asked them to rate themselves on a scale of 1–10 in taking risk in different domains, where 1 meant not at all prepared and 10 meant very much prepared to take risk. Participants rated themselves in five domains comprising finance, leisure, career, health, and education (see further explanation in Section 3.2).

3.2. Data

The total number of participants in the experiment was 37 (We did not include in our analysis information from participants who indicated they sold or passed on their forestlands to other family members). Table 1 shows the summary statistics of the variables. The average bets or amount invested in the frequent and infrequent evaluation periods were 50.44 and 57.89, respectively. The average amount of forestland owned by participants was 1255.21 acres. Of the participants, 92% were males with an average age of 52.58 years. The average level of education was bachelor's degree, and average 2016 income reported by participants was $115,760.90.

Participants also rated their risk tolerance levels on a scale of 1 to 10 under five different domains which are also shown in Table 1. The finance domain is referring to financial management and investment decisions of forestland owners. Leisure refers to use of free time for enjoyment. Examples include deriving recreational benefits such as hunting and bird watching from one's forestland. With the career domain, we mean the occupation a participant would choose for a significant period in her life. The health domain is referring to the state of being free from illness or injury. The education domain refers to gaining an enlightening experience. The average risk ratings were 5.68 in the finance domain, 6.56 in the domain of leisure, and 5.88 in the domain of career. The rest were 4.08 in the domain of health and 6.12 in the domain of education.

Table 1. Summary statistics of selected variables.

Variable	Mean	Standard Deviation
Aggregate Investment amount (Frequent)	50.44	20.57
Aggregate Investment amount (Infrequent)	57.89	26.03
Forestland (in acres)	1255.21	3724.78
Gender (1 if male, 0 otherwise)	0.92	0.27
Age	52.58	12.58
Education level (years)	17.56	1.55
Income (in U.S. dollars)	115,760.90	52,928.10
Domain:		
Finance	5.68	1.95
Leisure	6.56	1.94
Career	5.88	2.33
Health	4.08	2.29
Education	6.12	2.52

4. Theory and Methods

If our understanding of forestland owners' behavior is wrong, well intended forest conservation programs may backfire. To incorporate behavioral insights into preferences, we assume that investors have preferences over returns instead of consumption of returns [11]. Additionally, utility of the investor can be defined over gains and losses using the value function proposed by Kahneman and Tversky [11,13]:

$$v(x) = \begin{cases} x^{\alpha} & if\ x \geq 0 \\ -\lambda(-x)^{\beta} & if\ x < 0 \end{cases}, \tag{1}$$

where $v(*)$ is the highest level of utility, x is the return from investment, λ is the coefficient of loss aversion. α and β capture diminishing sensitivity to gains and losses. Risk aversion of an individual with the preference function in Equation (1) is said to be moderate for gambles involving only gains, but strong for gambles that involve potential losses [12]. The utility of a gamble which pays, G, with x_i payoff and probability p_i is represented in the form:

$$V(G) = \sum \pi_i v(x_i), \tag{2}$$

where π_i is the decision weight associated with the outcome i and depends on the cumulative distribution of the gamble and p_i [11].

In our empirical investigation of MLA in forest owner's decisions, we followed Haigh and List [15]. Since every experimental subject participated in each round of the experiment, we decided between fixed and random effects model using a *Hausman* test to check for correlation between the unique errors v_i in Equation (3) and the regressors. The test was conducted with a linear bet function and the null hypothesis, which we failed to reject at even the 10% level, is that the unique errors are not correlated with the regressors. We estimated a left- and right-censored random effects *Tobit* model shown in Equation (3). The left-censuring limit is zero because the experimental subjects cannot bet below zero, and the right-censuring limit is 10 as the maximum bet possible.

$$B_{it} = x_{it} + v_i + \epsilon_{it}, \tag{3}$$

where $i = 1, \ldots, n$ panels (individuals), $t = 1, \ldots, T$ periods (rounds), B_{it} represents individual bet in each round, x_{it} is the individual characteristics at rounds t, ϵ_{it} is the error term, independent of v_i which is the unknown intercept for each individual and both are i.i.d N(0, σ^2_ϵ and N(0, σ^2_v respectively. We constructed panel data of individual bets and characteristics of participants to estimate parameters of Equation (3) using maximum likelihood.

From the questionnaire approach, we summed the composite scores from the participants' own rating of their risk aversion levels in the five domains and tested for internal consistency of the domains using *Cronbach's alpha* reliability test.

5. Results and Discussion

In Figure 1, we compare betting levels. We juxtapose our data with those of Gneezy and Potters [10] and Haigh and List [15]. The average bets from our frequent evaluation period is about 50, while that from the infrequent evaluation period is about 58. Our data show a similar pattern with that of Haigh and List (students). Since MLA predicts that the average bet from the infrequent evaluation period should be higher than that from the frequent evaluation period, our data show that forestland owners may exhibit MLA.

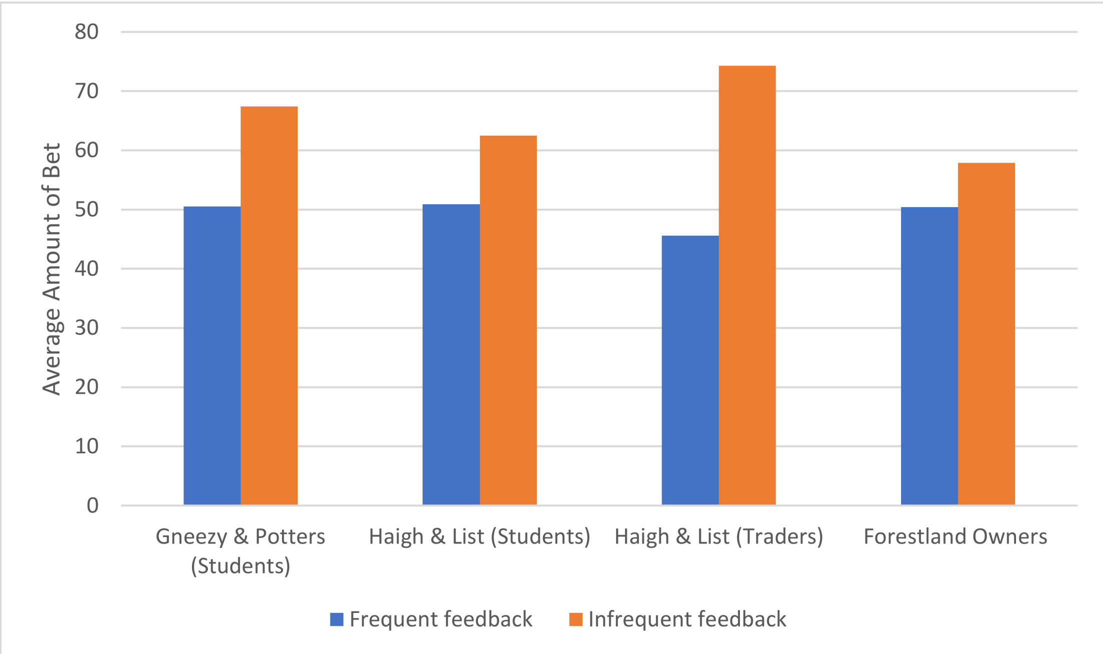

Figure 1. Comparing betting patterns.

In Table 2 are our random effects *Tobit* estimates. We estimate a panel data regression with the individual bets as our response variable. Model 1 does not control for forestland owners' characteristics, while model 2 controls for their characteristics. We find that frequency of evaluation, which is the most important variable in this study, is significant in both models. This implies that frequency of evaluation of investment returns of forestland owners affects their betting levels (willingness to invest). It interprets that betting levels are lower by about 1.02 or 0.88 units in the frequent evaluation period compared to the infrequent period. Haigh and List [15] found that frequent evaluation of investment returns of students and traders led to fewer bets. Gneezy and Potters [10] also found that students bet lower in frequent evaluation periods. Other significant variables in our regression are age of a forestland owner, level of education, and income. Betting levels go down by 0.07 as age of a forestland owner increases by one year. This shows that older forestland owners may be more risk averse than younger ones. We also find that forestland owners with higher education levels bet more than those with lower levels of education. A one year increase in education increases betting level by 0.48 units. Forestland owners with high education levels may be able to make informed decisions regarding investments that involve risk than those with lower levels of education, which suggests that the sign of the coefficient of the education level variable makes sense. Our results also suggest that forestland owners with higher incomes bet more than those with lower incomes. A dollar increase in income would increase betting level by 0.00001, which is small. Individuals with higher incomes may be willing to take more financial risk due to decreasing marginal utility of income.

Table 2. Random effects Tobit estimates [1].

Variable	Model 1	Model 2
Constant	6.9794 ***	−0.6327
	(0.2599)	(2.5609)
Forestland		−0.000003
		(0.00005)
Gender		1.3182
		(0.8331)
Age		−0.0711 ***
		(0.0149)
Education level		0.4781 ***
		(0. 1213)
Income		0.00001 ***
		(0.000004)
Frequent	−1.0232 ***	−0.8771 **
	(0.3631)	(0.3571)
chi2	7.94 ***	61.96 ***
Log likelihood	−1121.3146	−812.1586
Observations	486	360

Note: *** indicates 1% level of significance; ** is 5% level of significance; * is 10% level of significance. Values in parenthesis are standard errors. [1] In a robustness test, we compared average of three rounds of bets between the frequent and infrequent periods, and between average bets from the first nine periods of each evaluation period using the *Mann-Whitney nonparametric* test and find no statistically significant differences. It is however important to note that the novelty of this study is to determine how individual bets are impacted by characteristics of forestland owners and evaluation periods, which the parametric method is capable of showing.

Our results from the questionnaire approach are shown in Figure 2. We used a composite scoring system and forestland owners reported that they are willing to take more risk in the leisure domain with a score of 164 compared to the rest of the domains. This makes sense because many forestland owners manage forestlands for recreational and cultural purposes, including for aesthetic benefits rather than financial. From the composite scores, we find that forestland owners' willingness to take risk is low in the health domain with a score of 102. Compared with the leisure domain, participants also reported low willingness to take risk in the finance domain with a score of 142, career domain scored 147 points, and score of 153 for the education domain. A statistical test for the internal consistency of the risk rating gave a *Cronbach's alpha* score of 0.8 which is good and shows that the number of domains used in the risk rating did not affect the outcome of the rating.

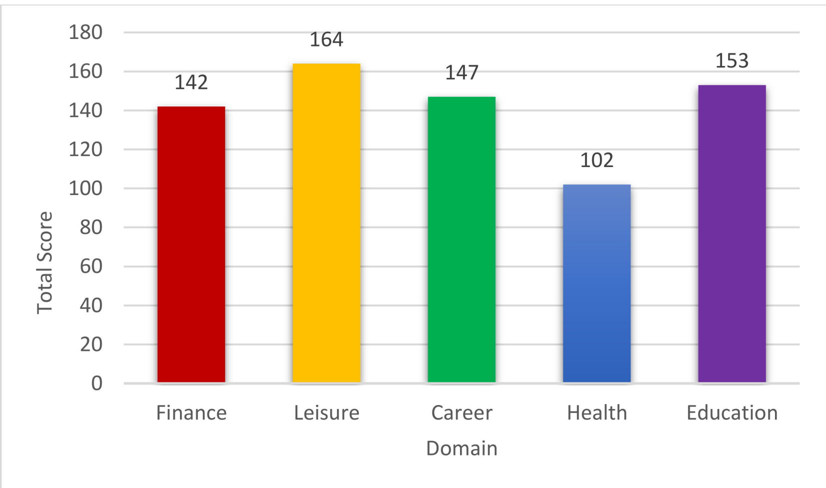

Figure 2. Risk rating by domain.

6. Conclusions

Forestland owners' participation in carbon markets will mitigate effects of anthropogenic climate change and also serve as an opportunity for them to earn supplementary revenue through sales of carbon credits. However, their rate of participation may be hindered by risk preferences among other factors. The fact is that carbon markets, including the CA-CTP program, have strict regulations including 100 years of easement as the minimum number of years a forestland can register in the carbon market. Evaluation periods, which can be annually under the CA-CTP program given the eligibility requirement of the offset project, may also affect level of participation of forestland owners. In this article, we investigate Myopic Loss Aversion (MLA) of forestland owners following Gneezy and Potters [10].

We used an economic experiment allowing forestland owners to bet portions of 10 units of endowments given to them in nine successive rounds of each of frequent and infrequent evaluations periods. In the frequent evaluation period, we find an average bet of about 50 units and that of the average bet from the infrequent evaluation period is 58 units. Our findings corroborate the results of Gneezy and Potters [10] and that of Haigh and List [15], suggesting that forestland owners may exhibit myopic loss aversion and may prefer evaluation periods of their forest market transactions to be infrequent. An additional test of our findings from the raw data and investigation of impacts of forestland owners' characteristics on betting levels was done with a panel data regression (random effects *Tobit* to be specific), which confirms that betting levels in the frequent evaluation period is lower than that of the infrequent evaluation period. This finding is also consistent with the findings of Haigh and List [15] and confirms that forestland owners may exhibit MLA. One of the limitations of this research is that we do not know the number of years that represents a frequent or infrequent period in real life. We also admit that there could be order effects, since all subjects in the experiment received the high frequency treatment first. Future experiments may try to investigate this order effect by alternating the frequency treatments among subjects. Finally, we elicited risk preferences of forestland owners under five different domains (finance, health, career, leisure, and education) and found that willingness of forestland owners to take risk is highest in leisure domain and lowest in health domain among the five domains.

From this research, we find that forestland owners exhibit MLA which implies that frequency of evaluation of their investment outcomes affects their willingness to invest, and they may prefer infrequent evaluation of carbon credits of their forest offset projects. The main purpose of this research is to inform decision-makers in choosing optimal frequency periods in the design of forest offset protocols to increase forestland owners' participation. However, we recommend that further research on risk preferences of forestland owners should be done before considering the main implication of our findings.

Author Contributions: M.A. and M.M. conceived, designed, and conducted the experiments. M.A. analyzed the data and prepared the manuscript. M.A. and M.M. both read and approved the final manuscript.

Funding: This research was partially funded by the South Carolina Natural Resources Conservation Services with grant # 2021917.

Acknowledgments: We thank Guy Sabin at South Carolina Forestry Commission, Bo Song and Hamed Majidzadeh at Baruch Institute for helping us in conducting the experiments. We also thank the two anonymous reviewers for their insightful comments.

Conflicts of Interest: The authors declare no conflict of interest.

Appendix A

Instructions:

As a forestland owner, you have been endowed with 10 units (1 unit = 5 cents) of an asset and you want to invest part or all the 10 units in a risky venture. There is about 33% chance of gaining 3 times the amount invested in returns or about 67% chance of losing all the amount invested. You are required to invest X amount *of the 10 units, where $0 \leq X \leq 10$. If you lose, you get negative X in return, while a gain implies 3 times X in return (To make calculation of returns easy enough for experimental subjects, we rounded 2.5 in Gneezy and Potters [10] and Haigh and List [15] to 3).*

Now, we want you to go through this experiment acting to reflect the way you take financial investment decisions with your forestland. *You are identified by your "assigned color" which is at the top of the form you are given. You are endowed with 10 units of an asset in each round and you decide how much of it you want to invest. You will record the amount you want to invest in the "amount invested" column for each round. We will then draw one of three colors: red, green, or blue. We want you to record the color drawn in the "round color" column next to the amount invested. And in the "win/lose" column, you write "win" if the round color matches your personal color, otherwise, you write "lose." The next step is to calculate your returns from the investment. Under the "returns from investment" column in the corresponding round, record 3 times the amount invested (X) if the round color matched your assigned color and you also recorded "win" in the "win/lose" column, otherwise, record negative of the amount invested. We now want you to calculate your total returns by adding 10 units to your returns from investment. Your total returns are recorded under the "Total Returns from Investment" column. We will come around to make sure your calculations are correct before we move to the next round. We will repeat the same experiment for each of the remaining eight rounds. We will always come around to check your calculations. At the end of round nine, please sum up all your total returns and record the value beside "grand total returns(G1)." We will then announce the instructions in part one B.*

References

1. Hamrick, K.; Galant, M. *Unlocking Potential State of the Voluntary Carbon Markets 2017*; Ecosystem Marketplace: Washington, DC, USA, 2017.
2. Reuters. *Point Carbon, Carbon Market North America*; Reuter: London, UK, 2010.
3. Kelly, E.C.; Gold, G.J.; Di Tommaso, J. The Willingness of Non-Industrial Private Forest Owners to Enter California's Carbon Offset Market. *Environ. Manag.* **2017**, *60*, 882–895. [CrossRef] [PubMed]
4. Khanal, P.N.; Grebner, D.L.; Munn, I.A.; Grado, S.C.; Grala, R.K.; Henderson, J.E. Evaluating non-industrial private forest landowner willingness to manage for forest carbon sequestration in the southern United States. *For. Policy Econ.* **2017**, *75*, 112–119. [CrossRef]
5. Markowski-Lindsay, M.; Stevens, T.; Kittredge, D.B.; Butler, B.J.; Catanzaro, P.; Dickinson, B.J. Barriers to Massachusetts forest landowner participation in carbon markets. *Ecol. Econ.* **2011**, *71*, 180–190. [CrossRef]
6. Miller, K.A.; Snyder, S.A.; Kilgore, M.A. An assessment of forest landowner interest in selling forest carbon credits in the Lake States, USA. *For. Policy Econ.* **2012**, *25*, 113–122. [CrossRef]
7. Cerroni, S.; Shaw, W.D. Does climate change information affect stated risks of pine beetle impacts on forests? An application of the exchangeability method. *For. Policy Econ.* **2012**, *22*, 72–84. [CrossRef]
8. Hand, M.S.; Wibbenmeyer, M.J.; Calkin, D.E.; Thompson, M.P. Risk preferences, probability weighting, and strategy tradeoffs in wildfire management. *Risk Anal.* **2015**, *35*, 1876–1891. [CrossRef] [PubMed]
9. Wibbenmeyer, M.J.; Hand, M.S.; Calkin, D.E.; Venn, T.J.; Thompson, M.P. Risk preferences in strategic wildfire decision making: A choice experiment with US wildfire managers. *Risk Anal.* **2013**, *33*, 1021–1037. [CrossRef] [PubMed]
10. Gneezy, U.; Potters, J. An experiment on risk taking and evaluation periods. *Q. J. Econ.* **1997**, *112*, 631–645. [CrossRef]
11. Benartzi, S.; Thaler, R.H. Myopic loss aversion and the equity premium puzzle. *Q. J. Econ.* **1995**, *110*, 73–92. [CrossRef]
12. Thaler, R.H.; Tversky, A.; Kahneman, D.; Schwartz, A. The effect of myopia and loss aversion on risk taking: An experimental test. *Q. J. Econ.* **1997**, *112*, 647–661. [CrossRef]
13. Kahneman, D.; Tversky, A. Prospect Theory: An analysis of decision under risk. In *Handbook of the fundamentals of financial decision making: Part I*; World Scientific: Singapore, 2013; pp. 99–127.
14. Charness, G.; Gneezy, U.; Imas, A. Experimental methods: Eliciting risk preferences. *J. Econ. Behav. Org.* **2013**, *87*, 43–51. [CrossRef]
15. Haigh, M.S.; List, J.A. Do professional traders exhibit myopic loss aversion? An experimental analysis. *J. Financ.* **2005**, *60*, 523–534. [CrossRef]

16. Langer, T.; Weber, M. Myopic prospect theory vs. myopic loss aversion: How general is the phenomenon? *J. Econ. Behav. Org.* **2005**, *56*, 25–38. [CrossRef]
17. Union of Concerned Scientist (UCS). *Existing Cap-and-Trade Programs to Cut Global Warming Emissions*; UCS: Cambridge, MA, USA, 2017.
18. Hsia-Kiung, K.; Reyna, E.; O'Connor, T. *Carbon Market California: A Comprehensive Analysis of the Golden State's Cap-and-Trade Program: Year One: 2012–2013*; Environmental Defense Fund: New York, NY, USA, 2014.
19. California Air Resources Board (CARB). *Compliance Offset Protocol U.S. Forests Projects*; California Environmental Protection Agency: Sacramento, CA, USA, 2015.
20. Marland, E.; Domke, G.; Hoyle, J.; Marland, G.; Bates, L.; Helms, A.; Jones, B.; Kowalczyk, T.; Ruseva, T.B. *Understanding and Analysis: The California Air Resources Board Forest Offset Protocol*; Springer International Publishing: Berlin, Germany, 2017.