

Anomalies in risk attitude and insurance take-up: aversion to losses depresses (not stimulates) insurance demand

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Abstract

Traditional economic theory suggests that:

- **risk aversion** (the concavity of Bernoulli's utility function) is the most important factor determining the demand for insurance;
- risk aversion **increases** insurance demand.

This study shows that:

- **loss aversion** (the concavity of Kahneman & Tversky's value function) is a more important factor determining insurance demand than risk aversion.
- loss aversion **decreases** insurance demand.

Loss aversion decreases the demand because consumers with narrow framing regard insurance as a *risky investment* (insurance does not pay out anything if an accident does not occur).

Introduction

Narrow framing (Kahneman & Lovallo, 1993) is a behavioral tendency to consider a problem within a narrow context. If individuals evaluate insurance within the narrow frame of the gain-loss outcome, insurance looks like a *risky gamble*, because the gain-loss structure of insurance is similar to that of a gamble.

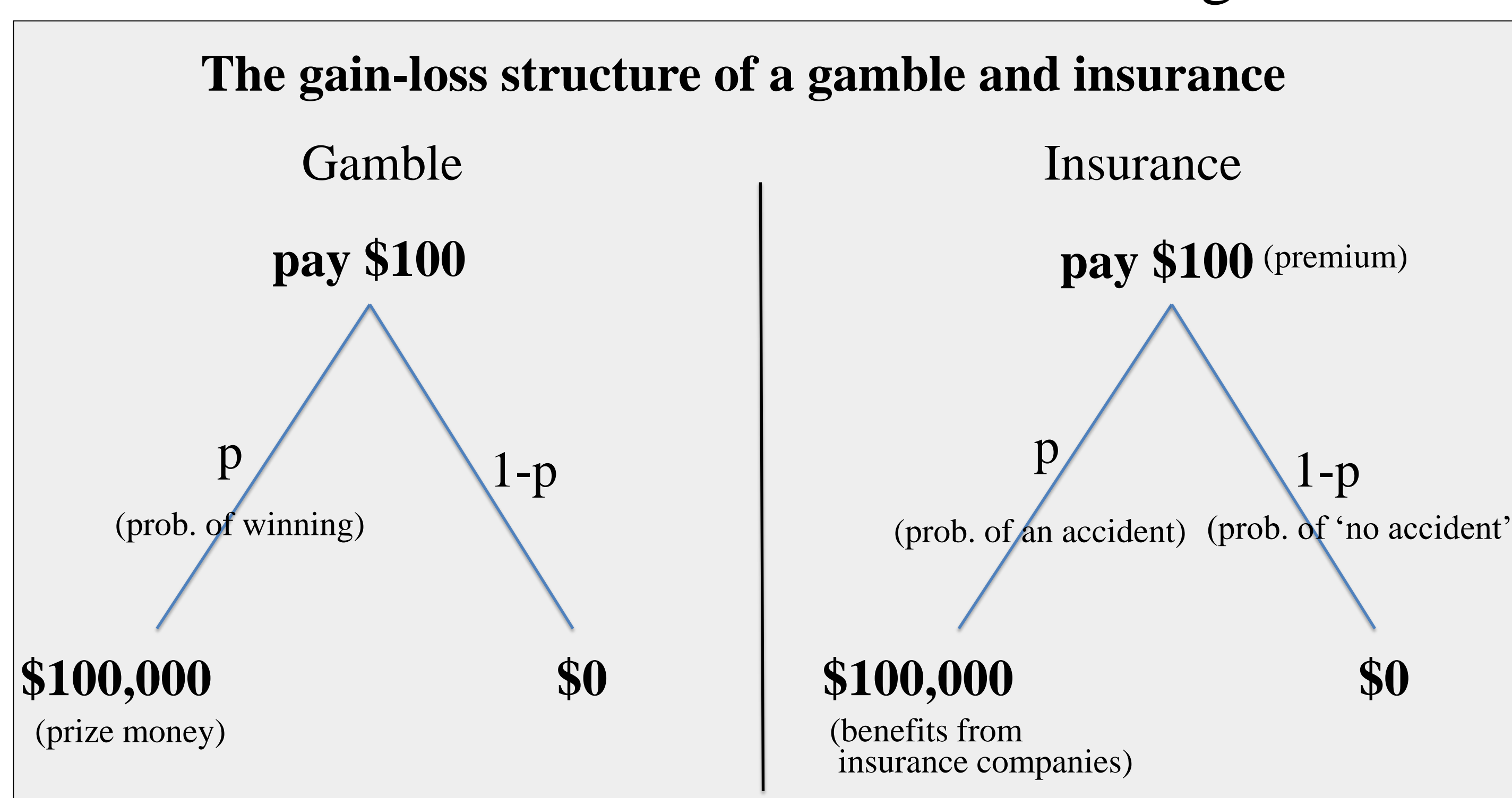


Figure 1: The gain-loss structure of a gamble and insurance is identical. Hence, insurance looks like a risky gamble to narrow framers. Note that "risk hedging effects" of insurance are neglected here.

Hence, narrow framers may evaluate an insurance policy based only on its gain-loss value (neglecting the hedging value), as if they were evaluating a gamble:

$$\text{Expected Value} = p * \text{Gain} - (1-p) * \lambda * \text{Loss}$$

The potential gain from insurance is the net benefit from insurance companies. The potential loss is the premium a consumer pays. The loss occurs if an accident doesn't occur (the insured get nothing from insurance companies).

where p is the probability of the gain (accident) and λ is the coefficient of loss aversion (relative disutility of losses vs gains).

Since the expected value is negatively associated with loss aversion, loss averse agents are less likely to buy insurance (if they have narrow framing).

→ This study tests this prediction

Empirical test

Hypothesis 1: loss averse individuals are less likely to buy insurance.

Hypothesis 2: the negative effect of loss aversion on insurance take-up is especially high among those with a high degree of narrow framing.

Data: public data from 2012-13 American Life Panel about loss aversion and insurance take-up (N=600)

Loss aversion measure: based on risky game questions

Survey question on loss aversion		
Do you want to play these risky games or not ?		
(equal chances of winning or losing)		
	Ex1) person i	Ex2) person j
(1) lose \$2 win \$6 (Yes / No)	Yes	Yes
(2) lose \$3 win \$6 (Yes / No)	No	Yes
(3) lose \$4 win \$6 (Yes / No)	No	No
(4) lose \$5 win \$6 (Yes / No)	No	No
(5) lose \$6 win \$6 (Yes / No)	No	No
(6) lose \$7 win \$6 (Yes / No)	No	No
	$\lambda_i = 6/2 = 3.0$	$\lambda_j = 6/3 = 2.0$

Results

1. U.S. individuals who exhibit high loss aversion (λ) show a significantly low take-up rate of health insurance

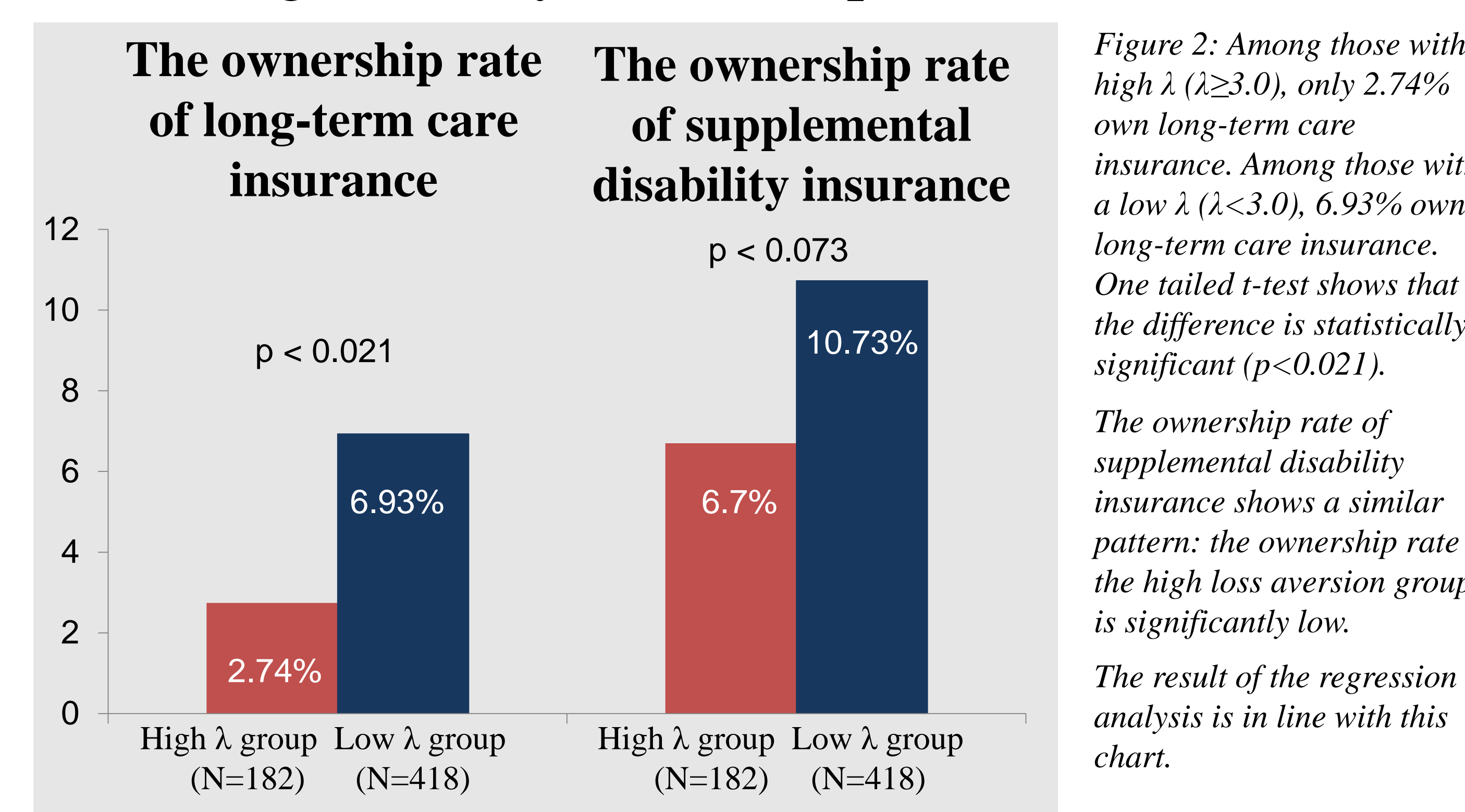


Figure 2: Among those with a high λ ($\lambda \geq 3.0$), only 2.74% own long-term care insurance. Among those with a low λ ($\lambda < 3.0$), 6.93% own long-term care insurance. One tailed t-test shows that the difference is statistically significant ($p < 0.021$).

The ownership rate of supplemental disability insurance shows a similar pattern: the ownership rate of the high loss aversion group is significantly low.

The result of the regression analysis is in line with this chart.

2. The negative impact of loss aversion is amplified by the degree of narrow framing.

The effect of loss aversion on the ownership of LTC insurance: low narrow framing group vs. high narrow framing group

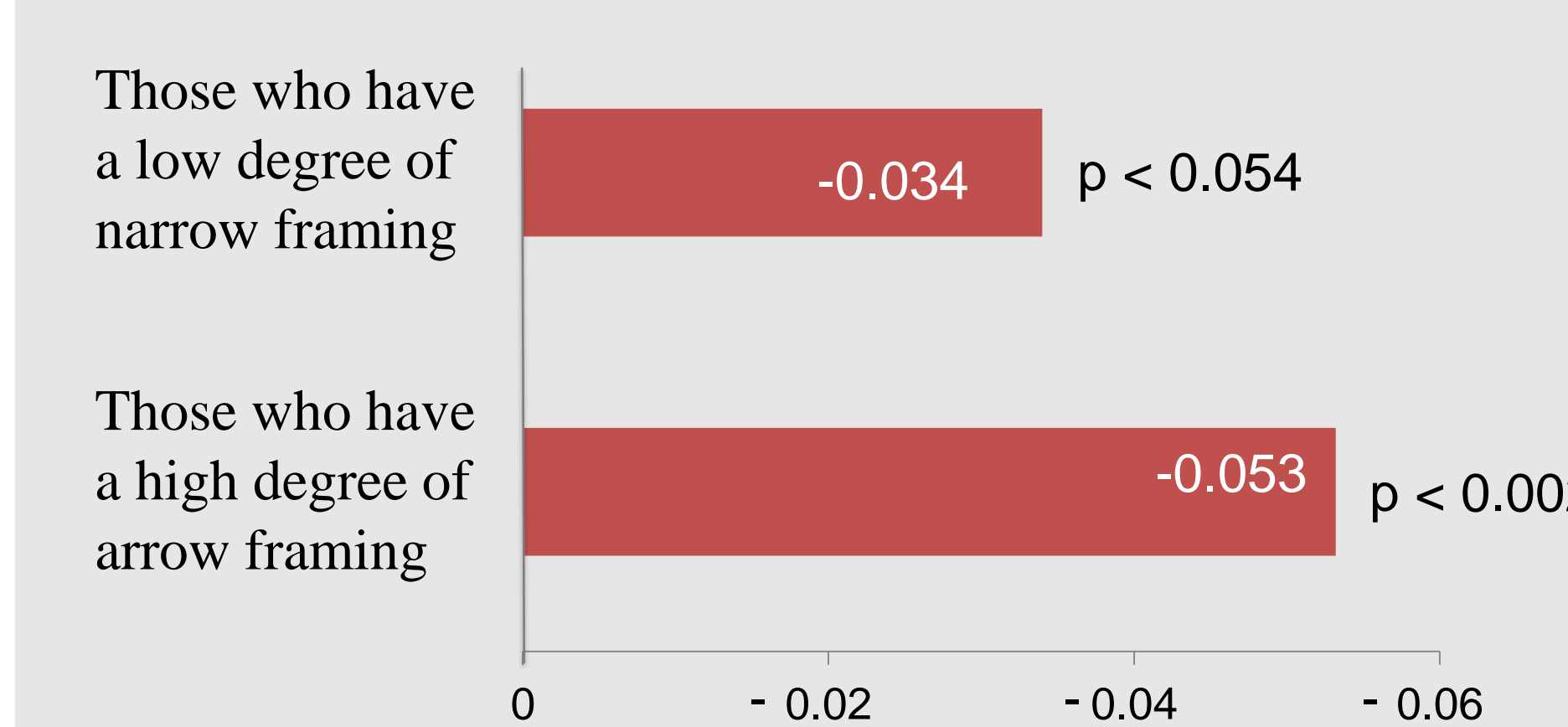


Figure 3 (The estimated coefficient of the dummy variable for high loss aversion ($\lambda \geq 3.0$) when the dependent variable is an indicator variable for owning long-term care insurance): -0.034 implies that having a λ equal to or greater than three decreases the probability of owning LTC insurance by 3.4 percent points if other things remain the same. High loss aversion decreases the probability by 5.3 percent points if the respondent has a high degree of narrow framing. The degree of narrow framing is proxied by an indicator variable for whether the respondent is subject to the "gambler's fallacy" or not.

3. The conventional risk aversion measure does not explain the take-up of long-term care insurance: the conventional risk aversion measure is not a significant covariate in explaining the ownership of LTC insurance.

4. Robustness: The results (the negative effect of loss aversion, the interaction between loss aversion and narrow framing) are robust to alternative control variables (wealth, the counterparty risk, the subjective expectation of probabilities of needing long-term care) and alternative econometric methods (logit model, linear probability model).

Conclusion

Results indicate that behavioral factors such as narrow framing and loss aversion play an important role in insurance take-up decisions.

The negative effect of loss aversion suggests that insurance can be perceived as something risky.

It implies that changing individuals' perception (or framing) of insurance is key to stimulating the demand for insurance.

Comparison with traditional economic theory

	Traditional economic theory	Behavioral approach of this paper
Key theory	Expected utility theory	Prospect theory Narrow framing / Mental accounting
Assumption	Individuals are perfectly rational & hence evaluate insurance based on its hedging effect on final wealth	Individuals are boundedly rational & hence evaluate insurance based on the "gain-loss" value of an insurance policy itself
Main idea	Individuals buy insurance to hedge their existing risk	Individuals might regard insurance itself as a risk
Implication	more sensitive to risk → more likely to buy insurance	more sensitive to risk → less likely to buy insurance

Acknowledgment

This poster is based on Hwang's (2015) paper, "Prospect Theory and Insurance Demand." (Available at SSRN)

Selected references

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