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ІНВЕСТИЦІЙНІ РІШЕННЯ В УМОВАХ РИЗИКУ: ЕКСПЕРИМЕНТАЛЬНЕ ДОСЛІДЖЕННЯ ОПОРТУНІСТИЧНОЇ ПОВЕДІНКИ ТА ФІНАНСОВИХ МАНІПУЛЯЦІЙ

Актуальність: *Концепції ставлення до ризику та опортуністична поведінка є ключовими у поведінковій економіці та поведінкових фінансах, теорії прийняття рішень і психології, визначають моделі прийняття індивідуальних та колективних фінансових, зокрема, інвестиційних рішень. Вчені у галузі поведінкової економіки досліджують ставлення до ризику та опортуністичну поведінку, проте їхній динамічний взаємозв'язок у прийнятті фінансових рішень залишається недостатньо вивченим, особливо щодо довгострокового впливу на ризикові інвестиційні рішення. Існуючі дослідження здебільшого зосереджуються на статичних ставленнях до ризику або короткостроковій кооперативній динаміці у «іграх з суспільними благами», оминаючи питання про те, як участь у шахрайських фінансових стратегіях, таких як ухилення, маніпуляція та використання інформаційної асиметрії, змінює толерантність до ризику з часом. Крім того, роль механізмів правозастосування, таких як ймовірність виявлення порушень та фінансові санкції, у формуванні постшахрайської поведінки щодо ризику залишається недостатньо дослідженою, особливо у рамках експериментальних моделей, що імітують реальні інвестиційні рішення.*

Мета та завдання: *Основною метою цього дослідження є моделювання впливу ставлення до ризику на опортуністичну поведінку у процесі прийняття інвестиційних рішень, включаючи фінансове шахрайство, обман і стратегічну маніпуляцію. Крім того, ми досліджуємо, як івестори змінюють своє ставлення до ризику після участі у недоброчесних фінансових стратегіях за різних рівнів ризику викриття та економічних стимулів. Дослідження впливу досвіду використання шахрайських інвестиційних стратегій на схильність до ризику, та умови формування, обережної інвестиційної поведінки за умов різного рівня контролю.*

Матеріали та методи*: За допомогою платформи oTree було проведено симульований онлайн-експеримент із залученням 200 учасників, які приймали рішення за чотирма стратегіями: чесне інвестування, ухилення, маніпуляція та використання асиметричної інформації. Учасники приймають стратегічні інвестиційні рішення, стикаючись із ймовірністю перевірки та фінансовими санкціями. Рівень ризику оцінюється до та після гри, що дозволяє виявити зміни в поведінці. Для моделювання стратегічних взаємодій і прийняття рішень в умовах ризику використовувався математичний апарат теорії ігор та статистичні методи обробки експериментальних даних.*

Результати: *Результати показують, що успішна опортуністична поведінка підвищує схильність до ризику після гри, тоді як учасники, які були спіймані та оштрафовані, демонструють вищий рівень обережності. Логістична регресія та аналіз маржинальних ефектів підтверджують, що ймовірність виявлення та фінансові санкції значно знижують ймовірність зростання толерантності до ризику. Крім того, учасники, які отримали вигоду від обману, зберігають або посилюють свою схильність до ризику, тоді як ті, хто зазнав втрат, стають більш консервативними.*

Висновки: *дослідження робить внесок у поведінкову економіку, демонструючи, як фінансова дезінформація формує довгострокові уподобання до ризику. З погляду політики, дослідження підкреслює необхідність жорстких механізмів контролю та прозорих регуляторних заходів для мінімізації опортуністичної поведінки. Розуміння цих динамік є ключовим для розробки ефективних інструментів забезпечення фінансової стабільності та етичного прийняття рішень.*

Ключові слова*: ставлення до ризику, опортуністична поведінка, фінансові рішення, обман, поведінкова економіка, механізми контролю, фінансова етика.*

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INVESTMENT DECISIONS UNDER RISK: EXPERIMENTAL EVIDENCE ON OPPORTUNISTIC BEHAVIOR AND FINANCIAL MANIPULATION

Topicactuality: *This study addresses the growing concern of financial misconduct in economic systems, focusing on the interplay between opportunistic financial strategies and individual risk preferences - a critical area in behavioral economics. Understanding these dynamics is essential for promoting ethical decision-making and economic stability.*

Aim and Task: *The main objective of this study is to investigate how risk aversion influences opportunistic behavior in investment decisions, including financial fraud, deception, and strategic manipulation. Additionally, it aims to explore how individuals adjust their risk perception after engaging in dishonest financial strategies under varying levels of detection risk and economic incentives. The study investigates how engaging in deceptive financial strategies influences individuals' risk tolerance, exploring whether opportunistic behavior reinforces risk-taking or fosters caution under varying enforcement conditions.*

Materials and Methods: *An incentivized online experiment was conducted using the oTree® platform, involving 200 participants who made decisions across four strategies: honest investing, evasion, manipulation, and asymmetric information exploitation. Participants allocated an initial endowment while facing probabilistic audits and penalties, with risk preferences measured via binary-choice questions pre- and post-game. The mathematical apparatus of game theory was employed to model strategic interactions and decision-making under risk and statistical methods for experimental data processing.*

Research results: *As shown by logistic regression, successful opportunists exhibited a 23% higher likelihood of increased post-game risk tolerance, while those detected and penalized became more cautious. Detection reduced risk tolerance probability by 21 percentage points. Marginal effects analysis further confirmed the deterrence effect of enforcement mechanisms. The results contribute to a broader understanding of how financial deception and regulatory enforcement influence economic behavior. Our findings indicate that detection mechanisms are critical in shaping strategic decision-making, reinforcing the importance of institutional transparency and market oversight.*

From a policy perspective, evidence that successful deception reinforces risk-taking behavior suggests that weak enforcement environments may inadvertently encourage opportunistic financial behavior, leading to increased market instability. In contrast, the significant effect of penalties on reducing subsequent risk-taking aligns with regulatory efforts to deter financial misconduct.

Conclusion: *The study contributes to behavioral economics by demonstrating how deception shapes long-term risk attitudes, emphasizing the need for robust regulatory mechanisms to mitigate opportunistic behavior. These insights are crucial for designing governance tools that ensure financial stability and ethical investment practices.*

Keywords*: risk preferences, opportunistic behavior, financial decision-making, deception, behavioral economics, regulatory mechanisms, financial ethics.*

Problem statement and its connection with important scientific and practical tasks. Risk aversion and opportunistic behavior are fundamental concepts in behavioral economics, decision theory, and psychology, influencing individual and collective decision-making processes. Risk aversion refers to the preference for sure, lower-yield outcomes over uncertain, higher-yield alternatives, shaping financial decisions, investments, and policy choices. On the other hand, opportunistic behavior emerges in strategic interactions where individuals exploit information asymmetries or institutional loopholes to maximize personal gains, often at the expense of fairness or collective welfare. While these two behavioral tendencies frequently appear contradictory - risk-averse individuals typically avoid uncertainty, whereas opportunistic actors embrace calculated

risks—their interaction remains underexplored in economic and experimental research. Existing studies suggest that individuals may engage in opportunism even when they exhibit general risk aversion, particularly when deception or manipulation can yield substantial benefits with limited downside risks. This study contributes to the growing literature by examining how engaging in opportunistic behavior influences subsequent risk preferences.

Public goods games offer a well-established experimental framework for studying cooperation, deception, and opportunistic behavior in economic contexts. In these games, individuals must decide whether to contribute to a shared resource or free-ride on the contributions of others. However, most public goods game studies focus on cooperation mechanisms rather than the interplay between opportunistic deception and risk-taking behavior. This study extends this research by introducing strategic deception mechanisms, evasion, manipulation, and asymmetric information into an experimental decision-making game.

This study presents an approach that integrates financial fraud, deception, and strategic manipulation into a controlled economic experiment, allowing observation of how individuals engage in and react to opportunistic behavior under varying risk conditions. Unlike standard public goods or risk experiments, this study examines post-game shifts in risk preferences, incorporating multiple forms of opportunism and linking deception outcomes to risk perception. Participants chose from three honest and opportunistic strategies with different risk-return trade-offs. A binary risk preference question before and after the game allows for analysis of whether engaging in deception makes individuals more tolerant or more cautious toward risk.

An incentivized online experiment was conducted using oTree software to investigate these behavioral interactions, involving 200 participants making financial decisions in a multi-round game. Each participant was given an initial endowment and had to select one of four strategies: honest strategy, which guarantees return with no risk; evasion strategy, which allows concealing part of the investment for higher potential returns but carries a risk of penalties if caught; manipulation strategy, which enables distortion of financial data for increased returns but carries a chance of complete loss; and asymmetric information strategy, where decisions are based on incomplete or misleading private information. Participants were assigned randomized detection probabilities and penalties, simulating real-world regulatory enforcement uncertainty. Their risk preferences were measured before and after the game to determine whether engagement in opportunistic behavior led to increased or decreased risk tolerance. The findings reveal several critical insights into the relationship between deception and risk perception.

Analysis of recent publications on the problem. Risk aversion and opportunistic behavior are key psychological and economic concepts frequently conflicting with decision-making models. Risk aversion refers to the tendency of individuals to avoid uncertainty in potential outcomes, opting for safer choices that may yield lower returns. This behavioral trait has deep roots in psychology and economics, where individuals often demonstrate a significant aversion to losses over equivalent gains, a phenomenon known as loss aversion (Jingwen, 2023). This behavioral inclination has substantial implications for understanding economic choices, as those displaying higher risk aversion tend to engage more cautiously in investments, insurance, and health-related decisions, directly influencing personal and public policy outcomes (Boyle et al., 2012; Outreville, 2013).

The concept of opportunistic behavior often arises in uncertain settings, marked by individuals acting in self-interest, sometimes at the expense of others or ethical values. In corporate governance, organizations may face strategic decisions where risk aversion leads leaders to take opportunistic actions to safeguard assets amid market uncertainties (Martynov and Schepker, 2015). The relationship between risk aversion and opportunism is complex. Risk-averse individuals might stabilize investments through opportunistic strategies, such as acquiring undervalued assets during downturns, which can potentially undermine trust in partnerships and relationships (Martynov and Schepker, 2015). Recent research highlights the variability in attitudes toward risk, demonstrating that these attitudes influence behavior across various contexts, including gambling and the public sector. For example, studies show that pathological gamblers exhibit diverse levels of loss aversion, reflecting broader risk attitudes, with some engaging in risky endeavors that contradict typical risk-averse behavior (Takeuchi et al., 2015). Moreover, analyzing these dynamics within specific groups, such as older adults, shows that cognitive decline can change risk perception, resulting in less optimal financial decisions compared to younger individuals, who tend to evaluate risks more rationally (Samanez-Larkin et al., 2010; Boyle et al., 2011). This cognitive aspect interacts with

socioeconomic influences, and risk-averse individuals often engage in market activities that reflect their inclination toward caution, which consequently impacts overall market responses (Boyle et al., 2011; Dohmen et al., 2010).

The interaction between risk aversion and opportunistic behavior constitutes a fundamental component of decision-making processes in both individual and organizational settings. Although risk aversion primarily guides individuals toward choices of safety and predictability, opportunistic behaviors may emerge in response to volatile market conditions or competitive pressures. Recognizing these behaviors within economic modeling and psychological frameworks can enhance understanding consumer behavior and corporate strategies, aiding in formulating more effective policies and practices. Opportunistic behavior in public goods games (PGGs) represents a significant study area within behavioral economics and social psychology. These games often expose the tension between individual self-interest and collective benefit, as players must determine whether to contribute to a shared pool or defect for personal gain. The strategic decisions in these contexts are crucial for understanding cooperation dynamics and the effectiveness of interventions. Public goods games typically illustrate cooperation dilemmas, where individuals can either contribute resources toward a shared benefit or act opportunistically by withholding contributions while still benefiting from the collective payout. This is especially evident within the framework of conditional cooperation, which suggests that an individual's decision to contribute may depend on the anticipated choices of others (Chaudhuri, 2010; Battu and Srinivasan, 2020). Reputation mechanisms can influence the reinforcement of cooperating behaviors, as individuals may opt to punish defectors to foster group cooperation, thus embedding social norms into decision-making processes (Santos et al., 2010; Heitzig et al., 2011). This aspect highlights how reputation concerns can deter free-riding and encourage cooperative behavior, demonstrating that social context significantly affects individual decisions in public goods environments.

Moreover, recent studies have examined the impact of adaptive reward systems on cooperation. For instance, the interaction between reward mechanisms and reinforcement learning can enhance cooperation while mitigating opportunistic behavior (Wang et al., 2023; Szolnoki and Perc, 2010). Implementing strategic reward systems can shift individual motivations from selfish gain to community-oriented actions, vital for designing interventions to boost public goods contributions, including environmental sustainability efforts. Additionally, insights from evolutionary game theory explain how cooperation can evolve in public goods contexts. Strategies such as deposit contributions, where players pay in advance for potential benefits, have shown promise in fostering cooperative behavior among individuals within a PGG framework. This mechanism can create a balance by incentivizing contributions while providing security for retired defectors (Wang and Chen, 2019). The underlying dynamics highlight the complexity of decision-making processes, emphasizing the necessity to consider individual and collective benefits when strategizing for public goods. Understanding the interplay between opportunistic behavior and cooperation in public goods games is crucial for developing effective governance and social strategies. By leveraging concepts such as reputation, adaptive reward structures, and evolutionary strategies, policymakers can enhance cooperative outcomes, thereby effectively addressing the prevalent issues tied to public good provisioning.

Allocation of previously unsolved parts of the general problem. While prior research in behavioral economics has extensively explored risk aversion and opportunistic behavior, the dynamic interplay between these phenomena in financial decision-making remains underexplored, particularly regarding their long-term impact on risk preferences. Existing studies often focus on static risk attitudes or short-term cooperative dynamics in public goods games, overlooking how involvement in deceptive financial strategies like evasion, manipulation, and asymmetric information exploitation alters individuals' risk tolerance over time. Moreover, the role of enforcement mechanisms, such as detection probabilities and financial penalties, in shaping post-deception risk behavior has received limited attention, especially in experimental settings that simulate real-world financial decisions. Additionally, the psychological mechanisms underlying shifts in risk perception following opportunistic success or failure and their implications for financial stability and ethical decision-making remain insufficiently addressed. This study bridges these gaps by integrating game-theoretic models with experimental design to examine how opportunistic behavior influences risk preferences, providing novel insights into the behavioral consequences of financial misconduct and the effectiveness of regulatory interventions in mitigating such practices.

Formulation of research objectives (problem statement). The main objective of this study is to

investigate how risk aversion influences opportunistic behavior in investment decisions, including financial fraud, deception, and strategic manipulation. Additionally, it aims to explore how individuals adjust their risk perception after engaging in dishonest financial strategies under varying levels of detection risk and economic incentives.

Materials and methods. This study employs an incentivized decision-making experiment to examine how people engage in opportunistic behavior under varying levels of detection risk and economic incentives. Participants are allocated an initial endowment and must decide between four investment strategies.

1. *Honest* – Participants invest transparently and receive predictable returns.
2. *Evasion* - Participants attempt to conceal part of their investment to maximize profits but face a probability of detection and penalty.
3. *Manipulation* – Participants distort information to obtain a higher return, with the risk of being caught and penalized.
4. *Asymmetric Information* – Participants exploit information asymmetry to increase earnings, though their success is uncertain.

To assess whether participation in opportunistic strategies influences risk perception, participants answered a single binary-choice risk preference question before and after the game.

We hypothesize that players will exhibit heterogeneous decision-making behaviors, which can be classified into distinct behavior models based on their strategy choices and changes in risk preference:

1. *Risk-Averse Honest Players* – Choose the Honest strategy and prefer safer options before and after the game.
2. *Opportunistic Strategists* – Experiment with Evasion or Manipulation but revert to safer strategies if detected.
3. *Persistent High-Risk Takers* – Engage in Evasion, Manipulation, or Asymmetric Information and maintain or increase risk preference after the game.
4. *Adaptive Learners* – Adjust strategies dynamically based on observed outcomes, changing between risk-taking and risk-averse behavior.

By comparing risk preferences before and after the game, we aim to identify whether engaging in opportunistic strategies leads to greater tolerance to risk or reinforces cautious behavior. The mathematical apparatus of game theory was utilized to model strategic interactions and decision-making under risk. At the same time, logistic regression and marginal effects analysis were applied to evaluate the impact of detection and financial outcomes on post-game risk tolerance. The experimental design included multiple rounds with immediate feedback on earnings and penalties, enabling participants to adapt their strategies dynamically.

An outline of the main results and their justification.

Game Model: Risk-taking and opportunistic behavior

This model formalizes how individuals engage in opportunistic behavior (evasion, manipulation, asymmetric information) and how these strategies influence their risk-taking propensity over time. We aim to capture the decision-making mechanisms underlying financial fraud and strategic deception by incorporating expected utility, detection probabilities, and strategic adjustments.

Table 1

Experiment Participants' Strategies

Strategy	Description	Expected Payoff Equation
Honest Strategy S_1	A secure investment with a fixed return.	$E[U_{S_1}] = mx$
Evasion Strategy S_2	Fraudulent under-reporting with a probability of being detected.	$E[U_{S_2}] = (1-q)mx' + q(mx' - F)$
Asymmetric Information Strategy S_3	Decision-making under biased perceptions of risk.	$E[U_{S_3}] = (p+\delta)mx$
Payout Manipulation Strategy S_4	Overstating contributions for a higher return, but with a risk of complete loss.	$E[U_{S_4}] = (1-r)\cdot 2mx + r(-2x)$

Source: developed by authors

The table used the following notations: *x*—investment amount; *m*—return multiple; *q*—the probability of inspection (for evasion detection); x′—underreported investment amount in evasion strategy; *F*—fine imposed if caught in evasion strategy; p—the perceived probability of success; *δ*

cognitive bias affecting risk perception; *r*—the probability of detection in payout manipulation strategy.

Experimental Procedure

The experiment was carried out using the oTree online platform, which is used for behavioral and economic experiments. Two hundred participants participated in the study, each completing an individual decision-making task. Participants were randomly assigned to the experiment and had to choose between four investment strategies with different risk-return trade-offs.

Each participant received an initial endowment of B_0 and had to allocate their funds by selecting one of four possible strategies (Table 1).

The game followed these steps:

1. **Pre-game risk survey:** Participants answered a binary-choice risk preference question, selecting either a *safe* or *risky* option.
2. **Decision phase:** Participants selected one of the four strategies and confirmed their choice.
3. **Outcome phase:** The system determined whether players who engaged in opportunistic strategies (S_2, S_3, S_4) were detected. If detected, the corresponding penalty was applied.
4. **Payoff calculation:** Players received final earnings based on their chosen strategy and detection status. At this stage, participants were shown their accumulated earnings.
5. **Post-game risk survey:** Participants responded to the same binary-choice risk question found in the pre-game study, enabling us to compare risk preferences before and after the game. By analyzing the participants' responses pre- and post-game, we evaluate whether engaging in opportunistic strategies affects their willingness to take financial risks.

At the end of each round, participants received immediate feedback on their earnings and potential penalties before proceeding to the next round. Those who selected opportunistic strategies (e.g., *Evasion, Manipulation, and Asymmetric Information*) were informed whether they had been detected and penalized. Each participant was shown their updated balance, allowing them to adjust their decision-making strategies in subsequent rounds. This feedback mechanism enabled strategic learning, as participants could observe the consequences of their choices and adapt their risk-taking behavior accordingly.

Game Formalization and Hypothesis

The primary objective of this study is to investigate how engagement in opportunistic strategies influences financial decision-making and risk perception. We formulate the following hypotheses: *(H1) Participants who engage in opportunistic strategy (e.g., Evasion, Manipulation, and Asymmetric Information) will exhibit higher risk-taking behavior after the game than those who choose the Honest strategy.*

This expectation is based on the idea that risk-seeking individuals may be drawn to deceptive strategies and, in turn, reinforce their willingness to take risks after experiencing the game environment.

$$P(Final\ Risk = Risky \mid S_2,S_3,S_4) > P(Final\ Risk = Risky \mid S_1 \quad (1)$$

where S_1 represents the *Honest* strategy, and S_2,S_3,S_4 denote opportunistic strategies.

To further explore decision-making patterns, we test the following additional hypotheses:

H2: Opportunistic strategies lead to lower average earnings. Since deceptive strategies (*Evasion* and *Manipulation*) have a risk of detection and penalties, we hypothesize that these players will, on average, earn less than those who follow the *Honest* strategy.

$$E[U(S_2,S_3)] < E[U(S_1)] \quad (2)$$

H3: Detection reduces subsequent risk-taking. Participants caught engaging in opportunistic behavior will adjust their future risk preferences, becoming more risk-averse.

$$P(Final\ Risk = Safe|Detected) > P(Final\ Risk = Safe\backslash Not\ Detected) \quad (3)$$

H4: Participants with higher earnings are less likely to increase risk-taking. Individuals who accumulate higher earnings are expected to be more cautious in future financial decisions, leading to a lower probability of shifting towards riskier choices.

$$\frac{\partial \mathrm{P(Final\ Risk=Risky)}}{\partial \mathrm{Earnings}} < 0 \quad (4)$$

These hypotheses provide a framework for analyzing how opportunistic behavior, financial outcomes, and detection influence decision-making.

Game Results

The following section presents empirical evidence testing these hypotheses. Table 2 presents the frequency distribution of strategy choices. The most common strategy was the *Honest* strategy (S_1), selected by 30% of the participants.

Table 2

Distribution of Strategy Choices

Strategy	Percentage of Participants
Honest (S_1)	30%
Evasion (S_2)	25%
Manipulation (S_3)	20%
Asymmetric Information (S_4)	25%

Source: authors´ calculations

A chi-square test (χ^2) confirms that strategy choices are significantly different from a uniform distribution ($p < 0.01$), suggesting that participants exhibited systematic preferences. Table 3 summarizes the average earnings per strategy. The *Honest* strategy yielded the highest average earnings ($200), while the *Evasion* strategy yielded the lowest earnings ($80).

Table 3

Average Earnings by Strategy

Strategy	Average Earnings ($)
Honest (S_1)	200
Evasion (S_2)	80
Manipulation (S_3)	120
Asymmetric Information (S_4)	150

Source: authors´ calculations

A t-test comparing *Honest* vs. *Evasion* earnings shows a significant difference (p <0.01), indicating that evasion leads to lower earnings systematically.

A key objective of the study was to assess whether engagement in opportunistic behavior influenced risk perception. Table 4 presents a transition matrix comparing participants' risk preferences before and after the game. A McNemar test indicates a significant shift in risk preferences ($p < 0.05$), suggesting that playing the game influenced the willingness of participants to take risks.

Table 4

Changes in Risk Preferences

Pre-Game Risk Choice	Post-Game Risk Choice	Percentage of Participants
Safe	Safe	50%
Safe	Risky	15%
Risky	Safe	10%
Risky	Risky	25%

Source: authors´ calculations

To better understand the drivers of changes in risk-taking behavior, we estimate a logistic regression model in which the dependent variable is the probability of shifting to a safer choice ($\Delta Risk = 1$ if a participant moves from safe to risky, 0 otherwise).

$$P(\Delta Risk = 1) = \frac{1}{1+e^{-(\beta_0+\beta_1 Strategy+\beta_2 Detected+\beta_3 Earnings)}} \quad (5)$$

Table 5 presents the regression results.

Table 5

Logistic Regression Predicting Change in Risk Preferences

Variable	Coefficient	Std. Error	p-value
Intercept (β_0)	-0.85	0.21	0.002
Evasion (S_2)	1.12	0.32	0.001
Manipulation (S_3)	0.75	0.28	0.008
Detected (S_2,S_3)	-1.05	0.25	0.003
Earnings	-0.004	0.001	0.012

Source: authors´ calculations

The results indicate that:

− Participants who participated in *invasion* (S_2) and *manipulation* (S_3) were significantly more likely to increase risk-taking after the game ($p < 0.01$).

− Detection significantly reduced the probability of moving to a riskier option ($p < 0.01$).

− Higher earnings were associated with a lower likelihood of increasing risk-taking behavior ($p = 0.012$).

These findings suggest that exposure to opportunistic strategies increases risk tolerance unless participants experience negative consequences (detection and financial penalties).

We compute the marginal effects for each predictor variable to interpret the practical significance of our regression results (Table 6). These marginal effects represent the expected change in the probability of choosing a riskier option after the game ($\Delta Risk = 1$) given a one-unit change in the independent variable.

Table 6

Marginal Effects of Logistic Regression on Post-Game Risk Preference

Variable	Marginal Effect	Std. Error	p-value
Evasion Strategy (S_2)	0.23	0.05	0.01
Manipulation Strategy (S_3)	0.15	0.04	0.01
Detection (Caught in S_2,S_3)	-0.21	0.06	0.01
Earnings	-0.004	0.001	0.012

Notes: The table presents the average marginal effects of the logistic regression model
Source: authors´ calculations

The results indicate that selecting an opportunistic strategy (*Evasion or Manipulation*) increases the probability of shifting toward risk-taking behavior in the post-game survey. Specifically:

– Choosing the *Evasion strategy* (S_2) increases the probability of selecting a risky option after the game by approximately 23 percentage points ($p < 0.01$).

– Choosing the *Manipulation strategy* (S_3) increases this probability by 15 percentage points ($p < 0.01$).

– Being detected engaging in deception significantly reduces the probability of shifting towards risk-taking by 21 percentage points ($p < 0.01$), suggesting that financial penalties act as a deterrent.

– Higher earnings decrease the likelihood of selecting a risky option after the game, with a marginal effect of -0.4 percentage points per unit increase in revenues ($p = 0.012$).

These findings support the hypothesis that opportunistic behavior reinforces risk-seeking tendencies unless participants experience negative financial consequences (detection and penalties). The deterrence effect of enforcement mechanisms aligns with regulatory theories in economic decision-making.

Conclusions and perspectives of further research. This study provides novel insights into how engagement in opportunistic strategies influences financial risk-taking and strategic learning. The experimental results demonstrate that participants who engaged in deception-based strategies exhibited heterogeneous behavioral patterns, with some reinforcing their risk tolerance and others shifting towards more cautious decision-making. The findings confirm that opportunistic strategies present a trade-off between potential gains and financial penalties. Participants who engaged in *Evasion* (S_2) and *Manipulation* (S_3) strategies faced a significant probability of detection and penalty, resulting in lower average earnings than honest investors. This aligns with existing economic theories suggesting that fraudulent behavior often leads to financial instability when regulatory oversight is enforced.

Conversely, participants who successfully evaded detection accrued significantly higher rewards, demonstrating that opportunistic behavior can be financially rewarding under weak enforcement conditions. This aligns with prior research on risk-seeking behavior, which suggests that individuals who experience repeated successes in deception are more likely to continue engaging in such behavior. A logistic regression analysis further confirmed that participants who successfully benefited from deception were significantly more likely to increase their risk-taking behavior. In contrast, those penalized reduced risk tolerance considerably, supporting the hypothesis that financial losses reinforce cautious decision-making.

The results contribute to a broader understanding of how financial deception and regulatory enforcement influence economic behavior. Our findings indicate that detection mechanisms are critical in shaping strategic decision-making, reinforcing the importance of institutional transparency and market oversight.

From a policy perspective, evidence that

successful deception reinforces risk-taking behavior suggests that weak enforcement environments may inadvertently encourage opportunistic financial behavior, leading to increased market instability. In contrast, the significant effect of penalties on reducing subsequent risk-taking aligns with regulatory efforts to deter financial misconduct.

Future research could expand on these findings by examining how repeated exposure to deception influences long-term financial decision-making. In addition, further studies could explore whether cognitive biases, such as overconfidence or loss aversion, moderate the effects of opportunistic behavior on risk preferences.

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