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Financial Trading Is Not Just a Gender-based Difference Issue. A Critical Investigation Across Market Mechanisms

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Abstract
As financial markets grow increasingly accessible and diverse, understanding the interplay between structural factors and individual behaviors has become more critical than ever. This paper investigates the dynamic relationship between gender differences, individual traits, and market mechanisms in shaping traders' behavior. With insight from the existing literature, we highlight the persistent differences in the financial decision-making process as the market structures change, and we examine how these differences are driven by gender differences as well as other individual factors such as financial literacy, risk attitude, or trading experience. Furthermore, we consider the transformative impact of technological advancements and market design elements—such as auction types, liquidity, and transparency—on trading behavior. The findings reveal the importance of tailored financial literacy programs, inclusive policies, and technological interventions to create equitable and efficient financial environments, empowering a wider range of traders and enhancing market performance.

JEL Classification: C90, G10, J16

Keywords
financial trading — market structure — gender differences — behavioral traits

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Introduction

Financial trading is one of the key activities driving contemporary economic systems. The technological advancements, the democratization of trading platforms, and an increasing awareness of investor behavior have all contributed to evolving investment trends, which have increased the complexity of financial markets. These markets, characterized by exchanging diverse assets - such as stocks, bonds, and derivatives - are shaped by numerous factors, including market structures, institutional frameworks, and individual decision-making behaviors.

Scholars have studied financial trading from various perspectives, exploring areas such as market efficiency (Fama, 1970, 1998; Lo, 2004), behavioral biases (Shefrin, 2002; Barberis and Thaler, 2003), and the impact of external shocks (Shiller, 1980). Among these, one prominent area of inquiry has focused on the role of gender in affecting trading behavior (Barber and Odean, 2001; Charness and Gneezy, 2012; Crosetto and Filippin, 2017). Several studies (see, e.g., Eckel and Grossman, 2008; Croson and Gneezy, 2009; Dohmen et al., 2011) suggest gender differences in risk preferences, overconfidence levels, and decision-making approaches. Specifically, men are often described as more overconfident and risk-seeking than women, generally perceived as more risk-averse and deliberate. These findings have influenced policies aimed at promoting gender diversity in financial markets, yet they risk oversimplifying a multifaceted and complex phenomenon.

While gender undoubtedly influences financial decision-making, it is far from being the sole, or even the primary, determinant of trading behavior. Instead, this behavior is primarily attributable to market mechanisms, institutional structures, and individual differences – such as experience, financial literacy, and cultural context – in which gender difference can play a relevant role (Eckel & Füllbrunn, 2015; Hasler and Lusardi, 2017). For instance, Hsu et al. (2021) find that it is not gender difference per se that drives variations in investment behavior, but rather the level of financial literacy. They show that when financial literacy is high, no significant gender difference in investment choices occur. Additionally, recent studies indicate that technological advancements have significantly transformed trading behaviors and perceptions of financial markets (Koskelainen et al., 2023), reshaping gender-based behavioral differences (Hargittai and Hinnant, 2008; D'Acunto et al., 2019). Women are not only more risk-averse and unconfident than men in their financial decisions (Dohmen et al., 2012; Huang and Kisgen, 2013) but also more rational (Powell and Ansic, 1997; Beckmann et al., 2008). This allows them to invest less but more successfully (Hira and Loibl, 2008; Montford and Goldsmith, 2016).

Furthermore, financial markets are not neutral environ-

ments, their design – such as auction types, liquidity levels, transparency, and transaction costs - significantly influences traders' behaviors in complex and multifaceted ways (Haruvy et al., 2007; Bloomfield et al., 2009; Attanasi et al., 2020). For instance, market rules significantly influence the extent and the nature of competitive behavior (Smith, 1962), and hence individuals' attitudes to trade (Haruvy and Noussair, 2006; Attanasi et al., 2016).

All these aspects highlight the need for a more comprehensive analysis of financial trading that incorporates both market structures and gender differences, to understand better how individual behaviors shape financial decision-making.

Therefore, this study seeks to disentangle the interplay between gender, individual traits, and market mechanisms in shaping trading behavior by conducting a comprehensive and critical review of the existing literature. Specifically, we examine whether commonly observed gender differences persist across various market structures and explore how these differences compare to other influencing factors, such as financial literacy, risk preferences, and trading experience. Our review focuses on the broader ecosystem in which trading occurs, highlighting how different market structures impact an individual's financial behavior. By synthesizing insights from prior studies, we aim to provide a clearer understanding of the complex relationships between market mechanisms, individual characteristics, and gender in trading contexts.[1]

Financial behavior under different market structures

Financial markets operate under various structures - such as double auctions, call markets, over-the-counter, and electronic platforms - that significantly influence trading behavior. These structures dictate how information is disseminated, trades are executed, and competition occurs.

Regardless of the digital dimension of the platform, these effects can be illustrated by comparing two polar negotiation environments: the *call market* and the *double auction market*.[2] The call market (Cason and Friedman, 1997) operates as a uniform price double auction, where participants submit bids and asks simultaneously, and no transactions occur during the trading period. Instead, trades are finalized at the end of the period based on aggregated bids and asks. Conversely, the double auction market (Smith, 1962) involves continuous bidding and offering, where units are traded individually, and negotiations for the next unit begin only after the previous unit has been traded. As a result, transaction timing differs significantly, with call markets aggregating trades after the trading period while double auction markets execute trades immediately as bids and asks match during the trading period.[3]

These differences in transaction mechanisms significantly influence individuals' financial behavior. Firstly, the delayed execution in the call market provides participants with more time for reflection and analysis, leading to more rational and deliberate decisions compared to the double auction market. Moreover, this aggregated execution process, minimizing the emotional impact of immediate volatility and price fluctuations, may attract more risk-averse traders. On the other hand, the real-time nature of the double auction market creates a high-pressure environment, which often leads to faster decisions that may be less reasoned, especially among less experienced traders (Satterthwaite and Williams, 1993; Cason and Friedman, 1997). This results in a market appealing only to higher risk-seeking traders, who thrive in volatile and competitive trading conditions. Additionally, the continuous flow of information in double auction markets enables participants to adopt more strategic behavior by adjusting their strategies in response to market signals, thus leveraging their competitiveness (Holt, 1995).[4]

Another polar differentiation that better elucidates how different market structures influence traders' behavior, independently of gender differences, is between the *over-the-counter market* and the *double auction market*. Attanasi et al. (2016) demonstrate that efficiency and market dynamics are the primary differences. Specifically, the double auction market consistently achieves higher efficiency since bids and asks are publicly visible, encouraging competitive pricing and quicker responses to trading opportunities. Conversely, the over-the-counter market, characterized by private bilateral negotiations and lack of transparency results in less information flow and greater inefficiency, as traders have limited knowledge of other offers in the market.[5]

These structural differences, once again, lead to distinct trader behaviors. In the double auction market, the continuous

[1] The main studies in the field, which consider an experimental approach, are reported in the final Appendix.

[2] Since these two financial trading markets differ in terms of market efficiency, liquidity, inclusivity, and transparency, they offer an ideal comparison for justifying how different financial behaviors are driven by varying market mechanisms, rather than solely by individual traits such as gender.

[3] Smith's (1962) seminal work on the impact of double auction market structure demonstrated how this market setup, more than other systems, encourages participants to rationally reach market efficiency. Davis and Holt (2021), in their comprehensive review of laboratory experiments, emphasized that market efficiency can be hindered by psychological factors such as loss aversion and overconfidence. Holt (2019) further explored how these factors drive participants to adopt strategic behaviors to achieve desirable outcomes and minimize losses.

[4] Previous studies have also demonstrated that variations in market structures, by shaping traders' behavior, significantly impact price formation and the convergence toward equilibrium. Smith (1962) suggests that competitive market equilibrium may not solely depend on the intersection of supply and demand but also their relative elasticity, with more elastic supply curves leading to upward price biases, particularly when buyer rents exceed seller rents. This "excess-rent hypothesis" links price adjustment speeds to virtual rent differences. Additionally, Cason and Friedman (1997) show that trading efficiency improves with greater information revelation and trader experience, though it often falls short of Bayesian Nash equilibrium predictions due to underrevelation of true preferences, leading to missed opportunities.

[5] These findings mirror Chamberlin's (1948) endeavor on imperfect markets, where he observed that isolated and decentralized bargaining reduces overall efficiency, due to limited price information (preventing convergence) and variable, unpredictable transaction times.

flow of information fosters more competitive and strategic behavior, as traders adapt quickly to market signals and actively seek profitable opportunities. This environment often leads to more opportunistic behavior and lower guilt aversion regarding the potential harm caused to other traders (Camerer and Fehr, 2006). The private and decentralized nature of the over-the-counter market promotes a more cautious, negotiation-driven approach. The lack of transparency and the reliance on trust-based relationships reduce competitiveness and strategic responses, as traders are less informed about broader market conditions. As in the call market, also this environment tends to attract more risk-averse traders, as the absence of immediate competition allows for more thoughtful decision-making. However, the information asymmetry and prolonged negotiations in the over-the-counter market result in less efficient outcomes compared to the call market, with traders potentially missing optimal opportunities, and hence less prone to stay in the market (Holt, 2006; Attanasi et al., 2016).

Therefore, different market structures are able to generate different emotional statuses, in terms of risk, guilt, and trust, that significantly affect individuals' financial decision-making process (Barberis and Thaler, 2003; Camerer and Fehr, 2006).

Another important element that affects traders' behavior together with the market structure, is associated with the *market size*, i.e. the number of traders in the market. A larger market often leads to increased liquidity and more competitive dynamics, as the interaction of more buyers and sellers encourages strategic behaviors, such as capitalizing on small price movements or exploiting arbitrage opportunities. Then, price discovery tends to be more efficient due to the greater volume of information being processed and the increased number of transactions, which can lead to faster adjustments to new information (Biais et al. 2005). In contrast, the limited number of traders in a smaller market reduces competition and liquidity, leading to higher transaction costs, less efficient price discovery, and potentially more volatile pricing. In such markets, large trades from a few participants can cause significant price fluctuations, and traders may rely more on interpersonal relationships and informal negotiations. The impossibility of preserving anonymity heavily influences psychology (Guiso et al., 2008), encouraging more cautious behavior and maintaining long-term relationships and reputations, thus adjusting trading strategies to avoid behaviors that could damage their standing with other market participants. In contrast, larger markets, with greater anonymity, can promote more competitive and opportunistic behavior, as the potential consequences of individual actions are diluted across a larger group of traders.

However, the given market structure mitigates the psychological effect of market size. Even if the traded quantity increases as the market size rises (Simth, 1962; Holt, 1995; Cason and Friedman, 1997; Biais et al., 2005), the market efficiency is differently reached across market structures (Gode and Sunder, 1993; Attanasi et al., 2016, 2020). For instance, Attanasi et al. (2016), focusing on two different market structures - double auction and over-the-counter - have shown that as the market size increases, in the former there is an increase in efficiency whereas in the latter a decrease, as traders tend to delay accepting offers, anticipating better ones from other traders. This strategic waiting reduces transaction volumes relative to a double auction market of comparable size. Similarly, Gode and Sunder (1993) demonstrated that even with zero-intelligence traders, market efficiency can still be achieved, but this is highly dependent on the underlying market mechanism. Building on this, Attanasi et al. (2020) compared human behavior with zero-intelligence agents in the same market environment, finding that in a double auction market, human performance aligns more closely with zero-intelligence predictions, while in an over-the-counter market, human behavior deviates significantly, leading to less efficient trading outcomes.

Traders in contemporary markets are not only influenced by market structure and size but also by the cognitive biases and emotional dynamics that *new technologies* both exacerbate and facilitate. Traders are becoming overconfident in the predictive power of their models as trading decisions are driven not by personal judgment but by algorithmic strategies or automated systems, which leads to increased risk-taking behaviors. Additionally, the fast-paced nature of electronic markets can foster overreaction and herding behavior, as traders may follow the crowd due to the real-time flow of information, creating a false sense of certainty (Harris, 2002; Barberis et al., 2005). These dynamics exacerbate psychological biases, such as overconfidence and loss aversion, as decisions are made quickly under pressure (Kahneman & Tversky, 1979). Furthermore, prospect theory studies suggest that subjects may be more risk-averse when facing potential losses but more willing to take risks to chase potential gains (Tversky & Kahneman, 1992); a tendency heightened by frequent and rapid trading.

Moreover, the rise of social media has consolidated a "herding behavior" (Scharfstein and Stein, 1990), with an excess of financial information, both accurate and inaccurate, challenging traditional assumptions of rational decision-making in markets (Shiller, 2020). These platforms intensify emotional reactions like fear and greed, contributing to sudden market shifts, such as the recent case of GameStop's short squeeze in 2021.

Gender differences in the financial decision-making process

Financial behaviors are not solely determined by market mechanisms (e.g., market structure, market size, market technology) but are also influenced by the individual characteristics of agents, such as financial literacy, risk preferences, and trading experience. Within this framework of personal traits, numerous studies have explored the *role of gender* as a potential driver of differences in financial decision-making, and hence on consequences for market efficiency (see, among others,

Barber and Odean, 2001; Gneezy et al., 2003; Niederle and Vesterlund, 2007; Charness and Gneezy, 2012; Crosetto and Filippin, 2017).

The literature presents an interesting debate on the influence of gender on financial behaviors. The majority of studies identify gender differences as a discriminant factor influencing financial choices, with women less prone to invest and more cautious when doing it, by preferring long-term and high-return investment options (Lewellen et al., 1977; Niederle and Vesterlund, 2007). However, a minority of studies recognize that while gender differences exist and significantly impact financial choices, they are not the predominant determinant of behavior. Instead, gender is part of a broader set of factors – risk and/or ambiguity preferences, trust attitude, and market knowledge – that primarily influence financial behavior (Kahneman and Tversky, 1979; Barber and Odean, 2001; Croson and Gneezy, 2009). Therefore, it is not gender per se that determines the differences in financial trading but different psychological traits, framing, financial literacy, and social dynamics. For instance, Kahneman and Tversky's Prospect Theory (1979) suggests that both men and women are subject to biases like loss aversion, which can strongly influence their decisions regardless of gender. Moreover, financial literacy and market experience often mediate or even outweigh the effects of gender on decision-making, showing that increased knowledge reduces gender-based disparities in financial behavior (Lusardi and Mitchell, 2008; Hsu et al., 2021). Additionally, the dynamics of financial advice demonstrate that gender interactions can affect risk preferences, with men, advised by women, taking on more risks, and women, advised by men, adopting a more cautious approach (Monne et al., 2024).

Furthermore, at equal levels of knowledge and competence in the financial world, studies have shown that women exhibit distinct behaviors according to the type of financial market they experience (Eckel and Grossman, 2008; Charness and Gneezy, 2012). These different behaviors suggest that women are not inherently less inclined to participate in financial markets. Instead, they tend to carefully evaluate the risks and benefits of a market and adapt their behavior accordingly (Schubert et al., 1999; Adams & Funk, 2012). Thus, we proceed in the dissertation with a critical perspective, leaning towards the dimension that women are not less competitive or capable than their male counterparts. Rather, they are more rational and strategically oriented, opting to trade only when there is a clear and profitable opportunity.

Notably, Beyer (1990) argues that women tend to underestimate their capabilities compared to men, even when they perform well. This self-perception induces women to assume a more conservative style and avoid competitive situations (Estes et al., 1988), by diversifying their choices (Graham et al., 2002). In contrast, men's overconfidence drives them to take greater risks, entering competitive markets at any cost (Schubert et al., 1999; Niederle and Vesterlund, 2007; Charness and Gneezy, 2012).[6] Additionally, this confidence level is weighted by the environment in which individuals operate as active traders. A competitive environment can induce behavioral differences as subjects adapt their strategies to distinct contexts (Schubert et al., 1999; Gneezy et al., 2003). The impact of the environment is also visible at a young age, as boys typically thrive in competitive settings while girls may not respond as positively, especially when competing directly against boys (Gneezy and Rustichini, 2004).

These differences in financial behavior according to the financial environment are further illustrated through classroom experiments. For instance, Holt (1999), focusing on two financial market environments - call market and double auction - found that, through sequential trading rounds, individuals can better understand the market rules and converge to an equilibrium price, adjusting intra[7] and extra[8] marginal units in both markets. Nevertheless, in the call market, where transactions occur at regular intervals and all orders are executed simultaneously at a determined equilibrium price, women, who on average are more risk-averse, may feel more pressured to make conservative bids to ensure transaction completion, regardless of the final gain. This could lead to lower performance due to the higher perceived risk of being excluded from the market. Conversely, women may perform better in the double auction market, where continuous bidding and offering allow for more flexible and ongoing negotiations. The less rigid structure of double auction provides women with more opportunities to adjust their strategies and engage in more collaborative and less aggressive negotiation schemes (Crosetto, and Filippin, 2017), potentially leading to improved performance outcomes compared to the more structured and competitive environment of call markets.

Policy implications and conclusion

Throughout this study, we have investigated the complex interplay between market structures, individual characteristics, and gender differences in shaping financial trading decisions. Although gender differences in risk preferences and financial decision-making are well-documented, they do not operate in isolation. Factors such as financial literacy, market experience, and trading environment design play pivotal roles in determining outcomes (Haruvy et al., 2007; Lusardi and Mitchell,

[6]Gender differences in selecting competitive tournament compensation schemes are influenced by varying preferences for performance incentives. Low-ability men tend to enter tournaments excessively, while high-ability women are less likely to participate, even when it would maximize their payoffs (Niederle and Vesterlund, 2007). This behavior is often driven by overconfidence, with men overestimating their abilities in domains perceived as masculine, such as financial trading, which leads them to trade more frequently than women (Barber and Odean, 2001). As a result, men are more likely to choose competitive schemes, even when their actual performance is comparable to that of women.

[7]The units of subjects able to remain in the market by succeeding in the transaction completion.

[8]The units of subjects unable to remain in the market by failing to complete their transaction.

2008; Bloomfield et al., 2009; Attanasi et al., 2020; Hsu et al., 2021, Monne et al., 2024).

Our findings suggest that policymakers and financial institutions should adopt more comprehensive strategies to improve participation and efficiency in the financial markets and trading activities. These strategies should address the systemic barriers inherent in financial structures, prioritize financial education, and utilize technological advancements to encourage inclusivity, moving beyond the simplistic gender-based issue.

To begin with, policymakers and financial institutions should promote tailored financial literacy programs to enhance the understanding of financial instruments and market dynamics. These programs should help investors to make more informed decisions, reducing the impact of psychological biases, such as risk aversion or under/over-confidence. In promoting these educational initiatives, they should prioritize underrepresented groups, particularly women.

Moreover, to incentivize gender diversity in financial markets and trading operations, authorities could intervene with subsidies, tax benefits, or targeted grants for women traders and investors (Adams and Funk, 2012).

Additionally, they may cultivate inclusive cultures that challenge stereotypes and promote gender equity in leadership roles (Sila et al., 2016). Mentorship programs, diversity training, and transparent performance evaluation criteria could help dismantle biases and create environments where all traders feel equally empowered to engage in financial markets.

Furthermore, with the increasing reliance on algorithmic trading and digital platforms, leveraging technology to provide greater transparency, personalized recommendations, and behavioral nudges could help individuals overcome cognitive biases, building trust and mitigating risk perception (Elbæk et al., 2022). For instance, tools that provide real-time feedback on trading decisions or simulate long-term outcomes could encourage more balanced and rational investment strategies.

Finally, considering the market structures, the introduction of hybrid structures that balance flexibility and transparency could cater to diverse trader preferences, accommodating both risk-averse and risk-seeking participants (Bloomfield et al., 2009). For instance, semi-aggregated auction formats could combine the deliberative aspects of call markets with the dynamic adaptability of double auctions, potentially reducing barriers for risk-averse traders while maintaining competitive efficiency.

By acknowledging the diversity of individual traits, the nuanced effects of market mechanisms, and the implications of technologies, policymakers and financial institutions can design financial systems that are equitable, resilient, and adaptive. These systems will better reflect the complexity of contemporary markets, driving financial growth while empowering a broader range of participants to thrive in the financial markets.

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Appendix

Author	Observations	Pool	Design	Game	Task	Treatment	Hypotheses	Results
Chamberlin (1948)	-	Students	Lab experiment	Imperfect competition market	Participants, assigned to the role of buyer or seller, are engaged in bilateral negotiations to determine transaction prices.	1. Different Buyer-seller configurations 2. Centralized market, with price list 3. Decentralized market, without price list	Market prices and quantities will deviate from theoretical equilibrium predictions due to: - Imperfect information - Individual bargaining	1. Transaction prices and quantities often deviate from competitive equilibrium. 2. Deviations attributed to the imperfect nature of real-world markets and individual behaviors.
Smith (1962)	-	-	Lab experiment	Double Auction Market	Participants were assigned role as buyer or seller, each with private valuations or costs, tasked to maximize profits by trading.	1. Varied supply and demand schedules 2. Different participant numbers 3. Alternative initial price conditions	Competitive markets will converge to equilibrium prices predicted by theoretical supply and demand curves.	Markets converge to competitive equilibrium prices, even with limited information and small participant numbers.
Powell & Ansic (1997)	126 in Insurance study method (64 male and 62 female) 101 in Currency market study method (66 males and 35 female)	Students	Lab experiment	Investment decision-making tasks	Participants engaged in financial decision-making tasks, including investment choices under uncertainty, insurance selection, and credit risk evaluations.	1. Risk levels: Low-risk or High-risk scenarios 2. Ambiguity levels: known or unknown probabilities 3. Incentive structures: monetary or non-monetary incentives	1. Gender differences are largely determined by contextual instance factors rather than trait factors. 2. Women exhibit more risk-averse behavior compared to men in financial decision-making. 3. Ambiguity amplifies gender differences in risk preferences.	1. Women were consistently more risk-averse than men, especially under ambiguous conditions. 2. Men preferred riskier options with potentially higher returns, while women prioritized safer, more consistent outcomes. 3. Gender differences were reduced but not eliminated when participants had access to additional information about probabilities and outcomes.
Cason & Friedman (1997)	152	Students	Lab experiment	Single Call Market	Participants played the role of either buyers or sellers and submitted bid and ask prices.	1. Different market size 2.Symmetric/ asymmetric information 3. Price/no-price restrictions 4.Centralized/ decentralized call markets 5. Update/no-update bids	1. Market prices should converge toward equilibrium in a competitive call market. 2. Price formation should be efficient, even in the presence of strategic behaviors.	1. Market prices often converged to competitive equilibrium, particularly in larger markets. 2. Information asymmetry between buyers and sellers led to price deviations from theoretical predictions. 3. Market size affected price discovery speed and accuracy, with larger markets reaching equilibrium more efficiently. 4. Participants' behavior sometimes deviated from rational expectations, especially when sellers engaged in strategic pricing or buyers held market power.
Schubert et al. (1999)	68 in Investment or insurance context (36 males, 32 females) 73 in Abstract gambling context (40 males, 33 females)	Students	Lab experiment	Contextual financial decision-making tasks	Financial decision-making tasks where participants had to choose between risky and safe investments.	1. Context treatment, investment or insurance decisions 2. Abstract treatment, gain/loss-gambling decisions	Different risk preferences are influenced by the framing of the decision and the context in which the risk is presented.	Women are more risk-averse when the decision is framed as a loss but are less risk-averse, or exhibit similar risk preferences as men, when the decision is framed as a gain.

Author	Observations	Pool	Design	Game	Task	Treatment	Hypotheses	Results
Holt (1999)	-	Students	Classroom experiment	Multiple economic games: 1. Market games, e.g. Double auction; 2. Public Good game 3. Auction games, e.g. Vickrey auction; 4. Trust game; 5. Ultimatum game	Students are engaged in several experimental economics games that simulate real markets	Market Experiments, Coordination Games, Voting and Public Choice	Classroom experiments can enhance student understanding by providing hands-on experience with economics principles, fostering deeper engagement with economic theory.	1. Classroom experiments are an effective way of teaching economics, encouraging active learning and participation, which deepens the understanding of economic mechanisms. 2. Classroom experiments allow students to engage in discussions about market outcomes, improving their ability to relate theoretical models to practical scenarios.
Barber & Odean (2001)	37,664	Households from a large discount brokerage	Field experiment, using real trading data	Trading activity	Participants' trading activity (buying and selling stocks) was analyzed over time to examine gender differences in trading behavior and performance.	-	1. Men are more overconfident than women in their stock investment decisions. 2. Overconfident investors trade more frequently and earn lower returns.	1. Men trade 45% more than women. 2. Frequent trading leads to lower returns. 3. Overconfidence is a key driver of this behavior.
Gneezy et al. (2003)	324	Students	Lab experiment	Competitive task (solving mazes)	Participants have to solve math tasks under competitive and no-competitive environments	1. Competitive environment 2. Non-competitive environment	Men will perform better in competitive environments than women, who perform better in non-competitive ones.	1. Gender differences in performance are driven by competition. 2. Men performed better than women in competitive settings. 3. Women performed as well or better than men in non-competitive environments.
Gneezy & Rustichini (2004)	140 (75 boys and 65 girls)	Elementary school children (9-10 years old)	Field experiment	Running race	Children were tasked with completing tasks under competitive and no-competitive conditions	1. Mixed-gender competition; 2. Single-gender competition	1. Boys will perform better than girls in mixed-gender competition. 2. There is no difference in competition in single-gender groups.	1. Boys performed better in competitive environments, while girls in non-competitive ones. 2. Girls were less competitive than boys in competitive situations but matched or outperformed boys in non-competitive ones. 3. Mixed-gender competition amplifies gender differences, highlighting the influence of social factors and environmental conditions over innate ability in competitive performance.
Niederle & Vesterlund (2007)	Two or three groups of four students per session	Students	Lab Experiment	Tournament-based performance	Participants were asked to solve math problems, with competition determining whether rewards were based on individual or relative performance.	1. Non-competitive treatment (piece-rate) 2. Competitive treatment (tournament)	1. Women are less likely to enter competitive environments compared to men. 2. Men are more prone to enter competition even when it is not in their best interest.	1. Women are less likely to opt into competitive environments when given the choice, even when they are equally qualified. 2. Men are more likely to compete, and their performance in competition often exceeds what is optimal.

Author	Observations	Pool	Design	Game	Task	Treatment	Hypotheses	Results
Eckel & Füllbrunn (2015)	108	Students	Lab experiment	Double auction	Participants, assigned to the role of buyer or seller, were engaged in bilateral negotiations to trade dividends.	1. All-Female markets 2. All-Male markets 3. Mixed markets	All-male markets generate higher speculative bubbles than all-female markets.	All-female markets generate smaller or "negative" bubbles compared to all-male markets.
Attanasi et al. (2016)	3,366	Students	Classroom experiment	-Double Auction -Over-the-Counter Market	Participants, in the role of buyer or seller, were engaged in bilateral negotiations	1.Trading mechanisms: DA vs OTC 2.Exogenous shocks	1. The average trading price in the OTC market tends to deviate more from the equilibrium price compared to the DA market. 2. OTC market allows more extra-marginal players to trade, leading to deviations from the competitive market surplus. 3. Market adjustments to exogenous shocks occur more rapidly in DA than in OTC	1. DA market is more efficient than the OTC market. 2. DA market rarely results in a traded quantity lower than the competitive quantity. 3. DA market's average closing price is close to the competitive price, while OTC market's closing price is significantly lower. 4. Inefficiency in the DA market is mostly due to extra-marginal players. 5. Shocks that reduce or increase competitive quantity slightly affect the efficiency of both markets, with the shock narrowing the efficiency gap between the DA and OTC markets during the shock period.
Crosetto & Filippin (2017)	1,085	Students	Lab experiment	-Holt and Laury (2002) -Eckel and Grossman (2002) -Bomb Risk elicitation	Subjects had to express their preference in each of the three games	Traditional vs safe option	Safe options activate gender differences in risk attitudes.	The presence of a safe option exacerbates gender differences in risk aversion, but does not fully explain the gender gap.
Attanasi et al. (2020)	6,400	Students	Lab experiment	-Double Auction Market -Over-the-Counter Market	Participants, in the role of buyer or seller, were engaged in bilateral negotiations	1. Trading mechanisms: DA and OTC 2. Market size: 10, 20, 40, and 80 traders	1. Zero-intelligence agents would achieve lower efficiency compared to human participants in DA and OTC markets. 2. Market efficiency would vary with market size, with larger markets showing better performance.	1. Human agents are more efficient than zero-intelligence agents in price formation. 2. DA markets are more efficient than OTC markets, particularly in larger markets. 3. Larger market sizes improve efficiency in both settings. 4. Zero-intelligence agents fail to achieve competitive prices, leading to lower efficiency than human agents.