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The Influence of Exposure to Investment Fluctuation on Impulse Buying Behavior: Mediating Role of Stress

verfasst von | submitted by

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Abstract

In recent years, the increasing improvement of investment apps in terms of accessibility and user-friendliness not only enabled people to theoretically monitor their investments more frequently, people actually do so. Although investing is typically done to improve one's financial situation it seems that technological advances cause a (short-term) opposite effect, due to an increase in impulse spending behavior. Existing literature highlights that increased exposure to financial information can influence stress levels and subsequently result in impulsive behavior and altered consumption behavior. The current study addresses the impact of exposure to investment fluctuation on impulse buying behavior, proposing that stress plays a substantial role in this relationship. The central argument posits that an elevated stress level, triggered by increased exposure to one's investment, leads to impulsive purchase decisions. Although no main effect was observed between exposure to investment fluctuation and impulse purchase behavior, the findings from an online experiment did support the proposed hypothesis that increased exposure to investment fluctuations induces stress, and stress in turn leads to impulse purchase behavior.

Abstract (german translation)

In den vergangenen Jahren haben sich Investment-Apps, insbesondere in Bezug auf Zugänglichkeit und Benutzerfreundlichkeit, deutlich weiterentwickelt und verbessert. Dies hat nicht nur dazu geführt, dass die Nutzer ihre Investitionen deutlich häufiger beobachten können, sondern es auch tatsächlich tun. Obwohl Investitionen in der Regel getätigt werden, um die eigene finanzielle Situation zu verbessern, scheint der technologische Fortschritt in diesem Bereich einen (kurzfristigen) gegenteiligen Effekt zu bewirken, indem impulsive Ausgaben zunehmen. Die Forschungsliteratur verdeutlicht, dass verstärkter Zugang zu Finanzinformationen das Stressniveau beeinflusst und folglich zu impulsivem Verhalten und verändertem Konsumverhalten führen kann. Aus diesem Grund untersucht diese Studie die Auswirkungen einer verstärkten Auseinandersetzung mit dem eigenen Investment auf impulsives Kaufverhalten und postuliert, dass Stress eine wesentliche Rolle in dieser Beziehung spielt. Es wird argumentiert, dass ein erhöhtes Stressniveau, ausgelöst durch häufigere Konfrontation mit den Schwankungen des eigenen Investments, zu vermehrt impulsiven Kaufentscheidungen führt. Obwohl kein direkter Haupteffekt zwischen der Exposition von Investitionsschwankungen und impulsivem Kaufverhalten festgestellt wurde, stützen die Ergebnisse eines Online-Experiments die Hypothese, dass eine verstärkte Exposition gegenüber Investitionsschwankungen Stress verursacht, der wiederum zu vermehrt impulsivem Kaufverhalten führt.

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1 Introduction

What drives people to invest their money? For most, the primary driver is presumably the expectation of future profits. Consequently, this motivation generally encourages investors to either postpone current consumption or at least make calculated purchasing decisions (Maharani & Saputra, 2021). However, with the rise of investment apps, individuals are now more often exposed to the fluctuations of their investments through these platforms (Fortagne et al., 2023; Gravier, 2021; Levi & Benartzi, 2020), giving rise to a peculiar phenomenon. Paradoxically, despite the initial intent to prioritize future gains, this heightened exposure appears to lead to more impulsive purchases, thus seemingly contradicting the initial motivation. One possible explanation for this phenomenon is that increased exposure to fluctuating investment values induces stress (Wazal & Sharma, 2017), which in turn results in increased impulsive spending behavior (Simpson et al., 2019).

What caused this phenomenon in the first place can be explained by a few key drivers. First and foremost, this development can be attributed to advancements in financial technology and high-frequency data, enabling a new generation of very user-friendly mobile investment apps (Fortagne et al., 2023; Gravier, 2021; Kalda et al., 2021; Levi & Benartzi, 2020; Dimson & Jackson, 2001). Their popularity surged around the beginning of 2020 when especially private, non-professional individuals, so-called retail investors, discovered these apps (Fortagne et al., 2023; Tahir & Danarsari, 2023; McCabe, 2021). This development can even be marked as a paradigm shift in how people interact with and manage their financial affairs (Kalda et al., 2021; Levi & Benartzi, 2020). Furthermore, the significant surge in the popularity of investing money and usage of trading applications was driven by the COVID-19 pandemic (Fortagne et al., 2023; Statista, 2023; Oksanen et al., 2022; Talwar et al., 2021; Chaudhry & Kulkarni, 2021; Malhotra, 2020). The lockdowns have provided investors and users of mobile trading apps with additional time to focus on stock price developments (Malhotra, 2020). Therefore, these apps appeared at just about the right time. They grant users the possibility to access real-time updates on their investment values, theoretically every second of the day (Gravier, 2021, Fortagne et al., 2023). In addition to individuals finding themselves with more leisure time, the allure of regularly monitoring investment balances became increasingly irresistible (Gravier, 2021; Levi & Benartzi, 2020; Dimson & Jackson, 2001). Yet, this constant monitoring has unforeseen consequences, since monitoring frequency has an impact on how the investment is perceived by the investor (Dimson & Jackson, 2001). The more people monitor their invest-

ments, the more they notice short-term fluctuations, which may lead them to overreact and consequently experience emotional distress (Gravier, 2021; Dimson & Jackson, 2001). Thus, this heightened awareness often results in elevated stress levels, a well-established psychological response within individuals who experience fluctuations in their invested savings (Osterland, 2023; Johnson et al., 2023; Gravier, 2021; Illing & Liu, 2006). However, monitoring one's portfolio every day not only leads to stress but can make one more susceptible to rash decision-making (Gravier, 2021), since being stressed is an unpleasant state people try to cope with in some way (Felman, 2023; Simpson et al., 2019; Moschis, 2007). Therefore, as a further consequence, stress can lead to active responses such as over-purchasing or impulsive spending (Mynaříková & Pošta, 2022; Simpson et al., 2019).

All in all, the emergence of these new forms of online apps and platforms has made it possible for retail investors to experience the fluctuations of their investment at a notably higher frequency (Gravier, 2021, Fortagne et al., 2023). Yet, this increased exposure may have a substantial influence on people's stress levels, and, in further consequence, on their impulsive buying behavior (Oksanen et al., 2022), contradicting the initial motivation behind investing. Accordingly, the study aims to test whether increased exposure to a fluctuating investment leads participants to experience a higher level of stress, which in turn leads to increased impulsive buying behavior.

2 Theoretical background

2.1 Exposure to investment fluctuation: A trigger for impulsive spending behavior

Literature indicates that smartphone-based investment applications exhibit a high degree of effectiveness in influencing consumers and changing their consumption and spending behavior (Kalda et al., 2021; Levi & Benartzi, 2020; D'Acunto et al., 2019). It was found that the use of these applications promotes intuitive, fast, instinctive and emotional decision-making, which prompts consumers to make impulsive purchases, such as ordering more unhealthy food items (Kalda et al., 2021). However, further clarification is needed to understand how the usage of investment apps contributes to impulsive spending behavior. One explanation is that these apps expose people more frequently to the fluctuations of their investments, which fosters an uncertain environment (Levi & Benartzi, 2020; Bar-Anan et al., 2009). Notably, in uncertain situations, common in investment-related scenarios, people feel stressed, tend to make decisions on a hunch, rely on intuition and seek quick solutions rather than opting for a more deliberate decision-making process (Osterland, 2023; Dickins und Schalz, 2020; Kurhade & Wankhade, 2016; Bar-Anan et al., 2009). People even show an increased willingness to pay for the resolution of relatively distressing uncertainty (Lovallo & Kahneman, 2000). Therefore, it appears that volatility and uncertainty elicit certain responses within individuals, thereby influencing their behavior (Peters et al., 2017). This assumption was again supported by recent research by Zhang et al. (2022), showing that perceived uncertainty indeed has a positive impact on consumers' purchase intentions. Therefore, increased exposure to investment fluctuations creates an uncertain environment, prompting an emotional reaction, with one common emotional response to such uncertainty being stress (Peters et al., 2017; Illing & Liu, 2006).

2.2 The stressful effects of increased exposure to investment fluctuation

Today, in the context of the information age, marked by the advances in information technology and the proliferation of FinTech products like investment apps, it has become so very easy to receive real-time information about one's investments that it is hard to not make use of it (Carlin et al., 2019; Lurie & Swaminathan, 2009). Now one would think that individuals who are using these apps are more informed about their financial situation and in further consequence more contented since they are better equipped to make deliberate decisions (Carlin et al., 2019; Lurie & Swaminathan, 2009). Yet it seems this is not always

the case and investment fluctuation rather acts as a "stressor" (Wazal & Sharma, 2017; Schneiderman et al., 2005). It has been shown that it often results in increased financial stress when individuals are confronted with the unpredictability of their financial state (Illing & Liu, 2006). Research by Qin et al. (2019) revealed that being exposed to stocks in a volatile market, both in falling and rising markets, has a significant negative impact on individuals' mental well-being and causes substantial emotional, psychological and physical stress among investors (Ma et al., 2010). Therefore, investment fluctuation in itself is already considered negatively by investors and investors will experience a negative emotional reaction to it (Morriss, 2022; Asebedo & Payne, 2018). Yet, increased monitoring reinforces this effect. The more one is actively involved in investing and closely tracks the movements of one's investment, the more likely one is to experience chronic stress symptoms (Wazal & Sharma, 2017).

For one, this can be reasoned by the fact that increased monitoring of one's own investment amplifies perceived fluctuations (Dimson & Jackson, 2001). This aligns with the intuitive understanding that when checking one's investment frequently, in short intervals, it might look more erratic (Washer et al., 2016; Dimson & Jackson, 2001). In contrast, by less frequent monitoring, in greater intervals, the investment might appear more stable (Washer et al., 2016; Dimson & Jackson, 2001). Or in other words, if one monitors one's investment daily or even more often, the fluctuation might appear very strong (Washer et al., 2016; Dimson & Jackson, 2001). On the other hand, if one looks at the changes only once a month, the returns may smooth out some of the day-to-day fluctuations (Washer et al., 2016). This can be attributed to the fact that the appearance of volatility can vary, depending on the time scale of measurement (Washer et al., 2016; Sinclair, 2013). For instance, when volatility is measured on a monthly basis, it tends to exhibit greater stability compared to daily measurements (Washer et al., 2016). Therefore, for one thing, frequent investment monitoring leads to an exaggerated perception of fluctuations, causing unnecessary stress (Gravier, 2021).

Secondly, people are prone to loss aversion, a key aspect of prospect theory by Kahneman & Tversky (1979). Loss aversion refers to the psychological phenomenon where people experience losses to hurt more than equivalent gains (Kahneman & Tversky, 1979). Further, it is assumed that investors evaluate their investment too frequently, which contributes to the prevalence of myopic loss aversion (Lee & Veld-Merkoulova, 2016). Myopic loss aversion, coined by Benartzi & Thaler (1995), refers to individuals exhibiting in-

creased sensitivity to losses compared to gains, together with the tendency to evaluate outcomes on a more frequent basis (Thaler et al., 1997). Therefore, increased evaluation of one's investment also increases the probability to observe negative outcomes (Gravier, 2021; Lee & Veld-Merkoulova, 2016; Dimson & Jackson, 2001), which has a greater negative emotional impact, or disutility, than the utility gained from equivalent positive outcomes (Kahneman & Tversky, 1979). In practical terms, individuals are more frequently aware of their investment, where losses are a possible outcome (Gravier, 2021). This increased awareness of losses also increases the emotional impact in the form of stress (Gravier, 2021).

Thirdly, receiving frequent information about one's investments causes individuals to excessively focus on recent data and neglect comparing information across multiple time periods, which may lead investors to react too strongly to just random fluctuations (Lurie & Swaminathan, 2009; Dimson & Jackson, 2001).

Fourthly, having increased access to real-time investment information even leads some investors to feel a sense of missing out if they do not consistently review the current state of their investment (Gáspár-Szilágyi & Pearson, 2021; Clor-Proell et al., 2019). Fear of missing out is known to show a positive correlation with depression and anxiety and was found to be a significant predictor of stress (Liu et al., 2023). In this regard, crypto trading in particular is an illustrative example. Cryptocurrencies are especially renowned for their notable volatility and growth potential and have gained popularity as high-risk investment instruments (Johnson et al., 2023). In just a brief span of time, the values of single coins can increase by more than 100%, only to subsequently decline shortly thereafter (Meng & Fu, 2020). For this reason, crypto trading is very likely an activity that has the potential to be highly absorbing, since it requires frequent monitoring of the investment and its price movements, which can even lead to compulsive checking (Delfabbro et al., 2021). Individuals who extensively participate in a specific activity often find it challenging to disengage from the activity (Delfabbro et al., 2021). They may continuously think about the activity and even prioritize it over other important responsibilities (Delfabbro et al., 2021). A study found that cryptocurrency traders find their quality of life intricately tied to the performance of their investment (Johnson et al., 2023). They also report a higher level of psychological distress and perceived stress than individuals who invest in stocks only monthly and those who do not invest at all (Johnson et al., 2023; Oksanen et al., 2022). Another study shows that cryptocurrency trading frequency is positively associated with symptoms

of depression and anxiety (Mills & Nower, 2019). However, not only cryptocurrency trading shows these effects, the usage of real-time stock-trading platforms is also associated with higher excessive behavior (Oksanen et al., 2022).

Thus, these new and upcoming investment apps and platforms provide a quick and easy way to access diverse investing opportunities and information about the investment once made. However, the abundance of constant information also comes with effects that extend beyond these functionalities (Oksanen et al., 2022).

2.3 Stress and impulsive buying behavior

Consumer goods, in addition to their functional utility, encompass supplementary psychological value (Mandel et al., 2017). Certain consumer products can even function as a kind of psychological remedy, capable of relieving various forms of distress (Mandel et al., 2017; Yurchisin et al., 2008). In marketing research, stress is widely acknowledged to play a crucial role in influencing consumer behavior (Di Crosta et al., 2021; Shams et al., 2021). Consumer behavior and marketing literature frequently conceptualize consumption as a way to deal with stress, where individuals modify their consumption habits (like avoiding choices, making particular decisions, etc.) to handle these challenging situations (Simpson et al., 2019; Mathur et al., 2006). For example, people have been found to choose more snacks when being stressed (Kandiah et al., 2008). This can be reasoned by the fact that many find comfort in the act of shopping as a coping mechanism (Kim & Chang, 2023). Shopping with the main intention of improving one's well-being or to alleviate stress has even coined its own term, referred to as "retail therapy" (Tiwari, 2023; Kang & Johnson, 2010). Further, predictions from applied and clinical psychology suggest that stress induces hyperarousal and impulsivity in individuals (Shams et al., 2021). Therefore, stress can contribute especially to heightened levels of impulsive and compulsive consumption (Simpson et al., 2019). These impulsive and therefore unplanned consumer purchases do not entail gathering information before the purchase and often happen unexpectedly and immediately, driven by an urgent desire for happiness and contentment (Hetharie et al., 2019). For this reason, especially impulse purchases often serve as a response to people experiencing stress, as a means to preserve or restore the individual's well-being (Shams et al., 2021; Youn & Faber, 2000).

3 Conceptual model

To seek the effect of exposure to investment fluctuation on impulse purchase behavior, the study will manipulate the independent variable to get an insight on how differently participants react when being either increasingly exposed to a fluctuating investment or less exposed to a fluctuating investment. It is expected that increased exposure to a fluctuating investment acts as a stressor and consequently leads to an increased stress level (H2). Furthermore, it is hypothesized that stress leads to an increase in impulsive buying behavior (H3). Ultimately, it is assumed that increased exposure to the fluctuating value of one's investment leads to an increase in impulsive buying behavior (H1), the positive effect being mediated by an elevated stress level (H4).

The conceptual model presented below illustrates the variables in the model and their hypothesized relationships:
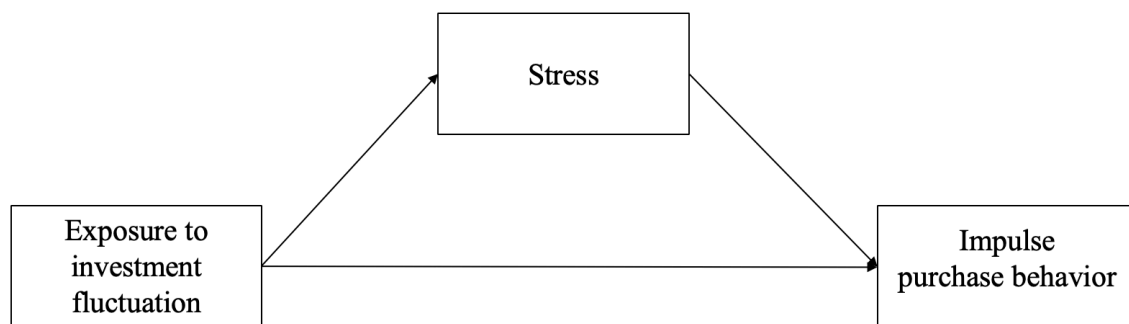
Figure 1 Conceptual Model

H1: There is a positive effect of exposure to a fluctuating investment on impulse purchase behavior.
H2: There is a positive effect of exposure to a fluctuating investment on stress.
H3: There is a positive effect of stress on impulse purchase behavior.
H4: Stress mediates the relationship between exposure to a fluctuating investment and impulse purchase behavior.

4 Methodology

4.1 Participants

An online experiment was conducted using a between-subjects design to ensure that the only systematic effect on participants' behavior was the manipulation of the independent variable (Field & Hole, 2002). Convenience sampling was used (Churchill & Iacobucci, 2018), and the data were collected over a two-week period from December 20, 2023 to January 4, 2024 (N = 111, M_{Age} = 35.07, SD_{Age} = 13.18, 56.8% female). Beforehand, a total of 49 participants had to be excluded, since not all questions were answered.

4.2 Design and procedure

After a brief welcome message, participants were randomly assigned to one of the two conditions: increased exposure to a fluctuating investment (Experimental group: N = 61) or limited exposure to the same investment (Control group: N = 50). Participants were told to envision the portrayed investment as their own, with the initial investment value set at €10,000.00. Both groups were then instructed to monitor the development of their investment as best as possible. Every time they pressed the button "show current value", participants got to see a new value along with the increase or decrease in profit, expressed in both absolute and percentage terms. Importantly, since participants decided when to press the button, the revealed values could be either positive or negative. The main difference between the two groups was that the experimental group had to reveal the value a total of ten times, before proceeding to the next question. In contrast, the control group was restricted to pressing the button only twice. As a result, they saw only two additional values along with the initial investment value, making them less exposed to their investment. Subsequently, participants from both groups were asked to indicate on a 7-point scale (1 = not at all, 7 = extremely) how much they believed the investment was fluctuating (M = 4.50, SD = 1.50), to ensure that the manipulation was successful.

4.3 Dependent measure

In a first part, the dependent variable impulse buying behavior was measured by examining the purchase probability for various items. Participants were asked to imagine themselves in a hypothetical shopping scenario with a budget of €20.00. Then they were presented with 25 products, a mixture of hedonic and utilitarian products (Durante & Laran, 2016;

Tinne, 2010), ranging from sweet and salty snacks to home decor and beauty products. The participants were free to choose which and how many products, as well as whether to purchase anything at all. The items cost as little as €1.19 and as much as €19.99 apiece, therefore every product was purchasable with the budget of €20.00. Any spending here would be unplanned since participants were unaware of the purchasing situation in advance (Vohs & Faber, 2007). Thus, this is a reasonable representation of an impulsive spending situation, modeled after the measure by Vohs & Faber (2007). To make sure there is no bias, the display of the products was randomized.

In a second part, it was measured whether participants show an acute inclination towards impulsive purchasing (De Vries & Fennis, 2019). For this purpose, the scale by De Vries & Fennis (2019) was used to capture state-dependent differences in the tendency to make impulsive purchases (De Vries & Fennis, 2019). Participants were asked to indicate their agreement with seven statements on a 7-point Likert scale (1 = do not agree at all, 7 = fully agree). "At this moment…" (1) "I feel like buying things spontaneously" (M = 3.65, SD = 1.86), (2) "*Just do it* describes the way I want to buy things" (M = 2.84, SD = 1.74), (3) "*I see it, I buy it* describes how I want to buy things" (M = 3.13, SD = 1.80), (4) "I feel like buying things according to how I feel at this moment" (M = 3.96, SD = 1.96), (5) "I feel like carefully planning my purchases" (reverse coded) (M = 4.00, SD = 2.00), (6) "I feel like being a bit reckless" (M = 3.17, SD = 1.82), (7) "I want to buy things without thinking" (M = 3.23, SD = 2.02) (De Vries & Fennis, 2019). The measures were internally consistent (Cronbach's α = 0.84). The mean of the seven items (M = 3.43, SD = 1.33) then formed the dependent variable impulse purchase behavior for the further analysis.

In order to assess the respondents' stress level after being either less or increasingly exposed to the development of the investment, an adapted and shortened version of the Short Stress State Questionnaire (SSSQ) was used (Helton & Näswall, 2015). The SSSQ is a reliable and short tool to assess and measure individuals' stress state and has proven sensitive to task stressors (Helton, 2004). Therefore, following the task of monitoring the investment, both groups were asked to indicate how well each of the following words describes how they felt during the task on a 5-point scale (1 = not at all, 2 = a little bit, 3 = somewhat, 4 = very much, 5 = extremely) (Helton & Näswall, 2015). (1) Dissatisfied (M = 2.56, SD = 1.09), (2) Impatient (M = 2.57, SD = 1.12), (3) Annoyed (M = 2.35, SD = 1.02), (4) Stressed (M = 2.60, SD = 1.19) (Helton & Näswall, 2015). The scale was translated into German language and the display of the four words was randomized. The

measures were internally consistent (Cronbach's α = 0.70). The mean of the four items (M = 2.52, SD = 0.80) then formed the mediator variable stress for the further analysis.

The final section of the questionnaire encompassed questions about the participants' age and gender. The survey ended with a debriefing message, and the participants were thanked for their participation.

5 Analysis

5.1 Results

As expected, the experimental group, which was increasingly exposed to the fluctuating investment, perceived the investment to fluctuate more ($M_{Experimental}$ = 4.84, $SD_{Experimental}$ = 1.28) than the control group, which was less exposed to the same fluctuating investment ($M_{Control}$ = 4.08, $SD_{Control}$ = 1.65; t(1, 109) = 2.72; $M_{Difference}$ = 0.76, Cohen's d = 1.46, $p <$ .004, 95% CI [0.20, 1.31]). The test revealed a significant distinction in fluctuation perception between the two groups, indicating the success of the manipulation. After the according assumption tests were conducted, Hayes' PROCESS macro (Hayes, 2013) model 4 with 5,000 bootstrapped samples at a 95% confidence interval was used to test the mediation. Since the dependent variable impulse purchase behavior was assessed in multiple ways, the mediation was tested by (1) using the means of the buying impulsiveness scale, (2a) using the total amount that was spent on products and (2b) the total sum of products bought by the participant.

(1) The relationship between the level of exposure and stress ($M_{Experimental}$ = 2.68, SD = 0.78; $M_{Control}$ = 2.32, SD = 0.80) was positive and statistically significant (b = 0.36, 95% CI [0.07, 0.66], p = .017). Also, the relationship between stress and impulse purchase behavior was positive and significant (b = 0.45, 95% CI [0.14, 0.76], p = .005). The indirect effect of level of exposure on impulse purchase behavior via stress was also positive and significant (b = 0.16, 95% CI [0.02, 0.37]). In other words, as expected, increased exposure to an investment increases stress, and increased stress in turn results in an increased tendency for participants to make impulsive purchases. However, the direct effect of exposure to the investment on impulse purchase behavior, in the presence of the mediator stress was neither positive nor significant (b = -0.49, 95% CI [-0.99, 0.01], p = .053). The total effect

of increased exposure on impulse purchase behavior was also negative and insignificant (b = -0.33, 95% CI [-0.83, 0.17], p = .197). Therefore, despite the fact that increased exposure to investment fluctuation elicited more stress, participants in the experimental group did not show increased impulse purchase behavior ($M_{Experimental}$ = 3.28, SD = 1.41; $M_{Control}$ = 3.61, SD = 1.22; t(1,109) = -1.30; $M_{Difference}$ = -0.33, Cohen's d = 1.33, p < .099, 95% CI [-0.83, 0.17]).
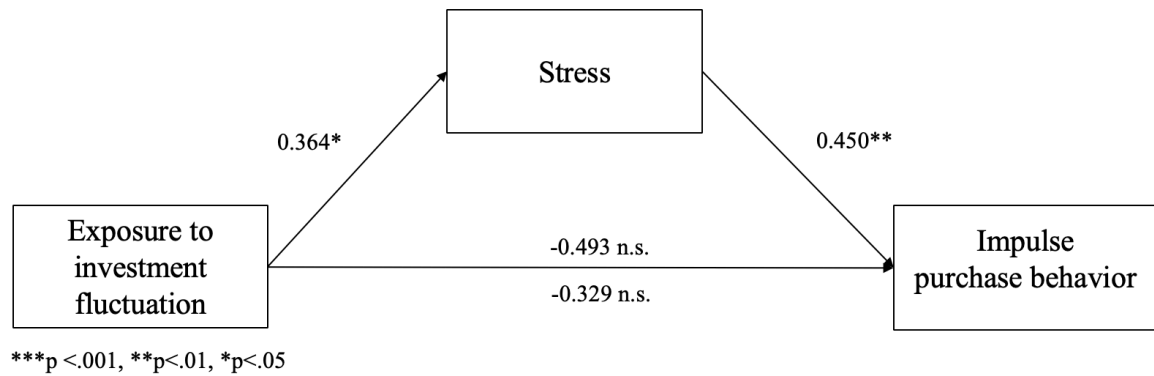
Figure 2 Conceptual Model / Hypotheses testing - Regression Coefficients

(2a) In a second part, instead of the scale variable for impulse purchase behavior, the total amount that was spent on products was used as dependent variable. The relationship between the level of exposure and stress was of course again statistically significant (b = 0.36, 95% CI [0.07, 0.66], p = .017). However, the relationship between stress and impulse purchase behavior was not significant (b = 1.01, 95% CI [-0.74, 2.76], p = .256). The indirect effect of exposure on the total amount spent via stress was not significant either (b = 0.37, 95% CI [-0.30, 1.38]). Also the direct effect of exposure on the total amount spent in the presence of the mediator stress was insignificant (b = -1.38, 95% CI [-4.12, 1.44], p = .335), as well as the total effect (b = -1.01, 95% CI [-3.76, 1.74], p = .468).

(2b) Lastly, the number of products bought was used as dependent variable. The relationship between the level of exposure and stress was of course once again found to be statistically significant (b = 0.36, 95% CI [0.07, 0.66], p = .017). However, the relationship between stress and impulse purchase behavior was not significant (b = 0.16, 95% CI [-0.27, 0.60], p = .462). The indirect effect of exposure on the number of products bought via stress was not significant either (b = 0.06, 95% CI [-0.10, 0.28]). Also the direct effect of exposure on the number of products bought in the presence of the mediator stress was in-

significant (b = -0.62, 95% CI [-1.32, 0.09], *p* = .086), as well as the total effect (b = -0.56, 95% CI [-1.24, 0.13], *p* = .110).

5.2 General Discussion

Today, the convenience of investment apps has increasingly simplified the process of investing, leading to a high rise in its popularity (Fortagne et al., 2023; Gáspár-Szilágyi & Pearson, 2021). Digital applications and platforms like Robinhood or eToro are only two of many examples (Barber et al., 2022; Oksanen et al., 2022). Previous research found that users considerably increase attention to their financial matters right after downloading a financial application on their mobile device (Levi & Benartzi, 2020), in some cases even leading to excessive behavior (Oksanen et al., 2022; Delfabbro et al., 2021) and severe psychological distress (Johnson et al., 2023; Oksanen et al., 2022; Mills & Nower, 2019). Therefore, it is crucial to examine the factors associated with mental health and especially stress, concerning these novel methods of investing and trading (Oksanen et al., 2022). For this reason, more and more studies have been focusing on the connections between financial apps, especially their ability to offer increased access to personal financial information, and the consequent effects on consumer behavior (Levi & Benartzi, 2020; D'Acunto et al., 2019). Yet, to the author's best of knowledge, the current study is the first to examine whether increased exposure to the fluctuation of one's investment, via inducing stress, influences consumer behavior in a way that increases the tendency to engage in impulsive purchases.

Supporting the initial hypotheses, the study shows that there is a positive relationship between increased exposure to a fluctuating investment and stress, as well as between stress and impulse purchase behavior, when measured with the adapted buying impulsiveness scale by De Vries & Fennis (2019), gauging participants' acute tendency to engage in impulsive buying. Therefore, the findings of the study support hypothesis 2 and hypothesis 3. Furthermore, the data collected and analyzed also demonstrate that there is a statistically significant positive relationship (indirect effect) between exposure to a fluctuating investment and impulse purchase behavior mediated by stress, supporting the predicted direction of the effect. Thus, the data of the study provided support for hypothesis 4 as well. However, no main effect could be statistically supported. The total effect between exposure to investment fluctuation and impulse purchase behavior showed to be insignificant, as well as the direct effect. For this reason, hypothesis 1 cannot be supported.

According to the criteria by Baron & Kenny (1986), who developed one of the earliest comprehensive approaches to understanding the mechanisms of mediation, the presence of a significant indirect effect, without a previously established significant relation between the independent and dependent variables, would not strictly meet their definition of mediation. However, the field of mediation analysis has evolved considerably since 1986, with many researchers and subsequent studies suggesting that the emphasis on the significance of the relationship between the independent and dependent variable, before as well as after mediation tests are conducted, lacks justification, and the absence of an initial significant direct effect does not invalidate the presence of meaningful mediation (O'Rourke & MacKinnon, 2018; Rucker et al., 2011; Zhao et al., 2010; MacKinnon, 2008). It is even argued that mediation analysis should prioritize the assessment and evaluation of indirect effects (Rucker et al., 2011). According to Zhao et al., (2010), who offer a more nuanced framework for mediation analysis, the absence of a direct effect, combined with a significant indirect effect, indicates indirect-only mediation, which means a mediated effect exists, but there is no direct effect (Zhao et al., 2010). Further, following their interpretation, this suggests that the identified mediator is consistent with the hypothesized framework (Zhao et al., 2010).

Although both the total effect and the direct effect are insignificant, with the direct effect only narrowly missing the conventional level of statistical significance ($p = .053$) and thus considered significant at the 10% level, this analytical path provides some insights and remains worth exploring (O'Rourke & MacKinnon, 2018). The negative direction of these effects suggests that the positive indirect effect via stress is counterbalanced by a negative direct influence (O'Rourke & MacKinnon, 2018; MacKinnon, Krull, & Lockwood, 2000). Consequently, without the mediator variable stress, exposure to investment fluctuation might actually decrease impulse purchase behavior, or at least not increase it. Moreover, the data pattern that the estimate of the total effect (b = -0.33) is closer to zero than the direct effect (b = -0.49) together with the indirect (b = 0.16) and direct effect having opposing signs, indicates the presence of inconsistent mediation, for instance, a suppressor effect (O'Rourke & MacKinnon, 2018; MacKinnon, Krull, & Lockwood, 2000). There might be an alternative process taking place, that suppresses the relationships in the model (MacKinnon, Krull, & Lockwood, 2000).

Furthermore, when assessing impulse purchase behavior using the "total amount spent" and the "number of purchased products", the mediation test did not show a significant rela-

tionship which is why hypothesis 3 and hypothesis 4 cannot be supported in these cases. One explanation for this outcome may be that the buying impulsiveness scale captured impulse purchase behavior more accurately compared to the measures derived from the product choice task. The scale may have captured subtle variations in individuals' tendencies toward impulse purchasing that were not fully captured by the product selection. Although it can be argued that the scale represents intention and the product choice task assesses actual behavior, the latter might be more influenced by factors other than impulsive tendencies, such as preferences or situational factors. Therefore, it seems in this case the scale might be a more valid and reliable measure to assess impulse purchase behavior, capturing the underlying psychological processes more accurately.

5.3   Limitations and further research

The current study looks at the influence of increased exposure to investment fluctuation on impulsive buying behavior, via stress. Although the findings offer theoretical support for this effect, the study faces certain possible limitations. Firstly, a potential hypothetical bias (Fifer et al., 2014) could arise when participants do not deal with their actual money and real investments. Since there are no real consequences for one's financial state, the emotional and psychological triggers might not have been as intense, leading to attenuated effects. Conversely, participants might spend the given €20 more quickly than they would their own money, given that it's not their own earned money and they do not feel the impact of a loss.

Moreover, the way people monitored their investment did not mirror a real-life scenario, as individuals typically check their investments at various points for a longer time period rather than within a single extended timeframe. The current study revealed that increased exposure to investment fluctuation does elevate stress levels, yet the severity of stress might differ greatly between the brief duration of exposure in the study to the real-world scenario, where investments can span decades, potentially missing out on the nuanced ways investors adjust to market volatility over time. In reality, the initial stress response to investment fluctuation might diminish as individuals become accustomed to the ups and downs, or conversely, stress could accumulate over time, leading to amplified behavioral outcomes than those observed in the study.

Furthermore, although the product choice task aimed to simulate a genuine shopping experience and categorically represent a vast array of products as best as possible, it still had its limitations as the product options were restricted, and participants were constrained by a spending limit of €20.00. In strict terms, also the product choice task still rather captures intention instead of actual consumption behavior, which may have reduced the overall effect. In a real-life setting, such as a supermarket with a wide product selection, the outcome might differ, since individuals might more readily give in to the impulse to purchase, for instance, their actual favorite snack. Therefore, further research should focus on the effects of increased exposure to investment fluctuation through investment apps involving ideally actual consumption behavior to test the effect under real-life circumstances. Moreover, the idea was to detect whether individuals change their purchase intention situationally, meaning if exposure to investment fluctuation would temporarily affect impulsive buying. However, the question remains how long the stress occurs in real life and in what time frame it has an effect on impulse purchase behavior.

However, future research should primarily aim to uncover the underlying reason for the absence of a main effect. This exploration could involve examining potential variables that might mask the direct relationship between the independent and dependent variable. Additionally, extending the study to a wider population and temporal spans could shed light on the conditions under which the mediated effect is strengthened or weakened.

Although the study already covered a range of product categories, its scope was limited, suggesting an opportunity for future exploration. Future research could, for example, examine the willingness to purchase expensive hedonic products, due to stress (Kim & Chang, 2023) induced by exposure to investment fluctuation in order to make oneself feel better. Alternatively, there might be an increased willingness to purchase functional products. This inclination could stem from a desire for control in an otherwise uncontrollable environment, functional products being a means to restore this sense of control (Durante & Laran, 2016). Furthermore, one could look at a different mediator in the framework, such as perceived powerlessness, possibly induced by the fluctuating value of one's investment, which leads to altered purchasing behavior as an attempt to restore and signal power (Rucker & Galinsky, 2008). Also the inclusion of moderator variables could enrich the understanding of the phenomenon. Financial literacy (Bai, 2023) or financial self-efficacy (Brooks & Williams, 2021; Asebedo & Payne, 2018) might act as such moderators. Experienced investors or individuals with more knowledge about investments and market de-

velopments may not experience increased stress in response to investment fluctuations. They rather see fluctuations as a normal part of investing, which could moderate the relationship between exposure to fluctuations and stress-related impulse purchases. Also individuals with high financial self-efficacy are typically more resilient when it comes to market fluctuations, maintaining their sense of control and confidence (Asebedo & Payne, 2018) and in further consequence, may not engage in impulse purchasing as a coping mechanism.

6 Conclusion

The study aimed to explore the relationship between exposure to investment fluctuation and impulsive purchase behavior, highlighting the contradiction that, although individuals invest to secure their financial future, the ease of monitoring one's investments through an app seems to paradoxically prompt more impulsive spending due to an increased stress level. The underlying assumption was that the increase in information accessibility through investment apps prompts individuals to monitor their investment more frequently. This heightened exposure to the fluctuation of one's investment was anticipated to trigger a stress response, subsequently leading to increased impulse purchase behavior as a coping mechanism. The initial literature review proposed that increased exposure to one's fluctuating investments positively affects impulsive behavior and decision-making. Furthermore, previous research has shown that monitoring one's investments actually triggers stress, and stress is known to be a significant factor when it comes to impulse purchase behavior. It was therefore assumed that the effect can be explained by an acute stress reaction, whereby the monitoring of one's own investments represents a stress factor. Contrary to expectations, the empirical results did not reveal a significant total effect of exposure to the fluctuating investment on impulse purchase behavior. However, the study showed that there is indeed a positive relationship between increased exposure to investment fluctuation and stress, as well as between stress and impulsive purchase behavior. Furthermore, the data support a statistically significant positive indirect effect between exposure to investment fluctuation and impulse purchase behavior mediated by stress, supporting the predicted direction of the effect.

7 Declaration of Generative AI and AI-assisted technologies in the writing process

During the preparation of this work, the author used Chat GPT in order to improve readability and language. After using this tool, the author reviewed and edited the content as needed and takes full responsibility for the content of the publication.

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Appendix: Survey

Introduction text

Liebe/r Teilnehmer/in,

mein Name ist Laura Sardest, ich befinde mich im Masterstudium der Betriebswirtschaft an der Universität Wien und schreibe derzeit meine Masterarbeit im Bereich Marketing. Mein Forschungsziel besteht darin, die Auswirkungen der Auseinandersetzung mit Investments auf das individuelle Stressniveau und das impulsive Kaufverhalten zu untersuchen. Der Fragebogen sollte etwa 5 Minuten Ihrer Zeit in Anspruch nehmen. Damit die Ergebnisse der Studie aussagekräftig sind, bitte ich Sie, den Fragebogen vollständig auszufüllen und keine der gestellten Fragen zu überspringen. Alle erhobenen Daten werden anonymisiert, können keiner bestimmten Person zugeordnet werden und werden streng vertraulich behandelt.

Vielen Dank für Ihre Teilnahme!

Exposure to investment fluctuation

Bitte stellen Sie sich vor, Sie haben **10.000€** in eine Aktie investiert. Ihre Aufgabe in dieser Studie ist es, möglichst genau zu erfassen, wie sich Ihr Investment entwickelt. Betätigen Sie dazu auf der nächsten Seite die Schaltfläche „Aktuellen Kurs anzeigen", dann sehen Sie den aktuellen Wert, den absoluten Gewinnzuwachs und den prozentualen Wertzuwachs.

Versuchen Sie nun, die Entwicklung Ihres Investments möglichst genau zu erfassen.

Klicken Sie so oft "Aktuellen Kurs anzeigen" bis erscheint "Gehen Sie zur nächsten Frage".

Die Entwicklung Ihres Investments:

Aktuellen Kurs anzeigen

Manipulation check

Wie sehr schwankt das Investment Ihrer Meinung nach?

Überhaupt nicht stark ⃝ ⃝ ⃝ ⃝ ⃝ ⃝ ⃝ Extrem stark

Mediator: Stress

Bitte geben Sie an, wie gut jedes Wort beschreibt, wie Sie sich **während der Auseinandersetzung mit Ihrem Investment** gefühlt haben:

	Überhaupt nicht	Ein wenig	Schon etwas	Sehr stark	Extrem
Genervt	⃝	⃝	⃝	⃝	⃝
Gestresst	⃝	⃝	⃝	⃝	⃝
Ungeduldig	⃝	⃝	⃝	⃝	⃝
Unzufrieden	⃝	⃝	⃝	⃝	⃝

Dependent variable: Impulse buying behavior

Bitte geben Sie an wie sehr sie den folgenden Aussagen zustimmen:

In diesem Moment...

	Stimme überhaupt nicht zu						Stimme voll und ganz zu
	1	2	3	4	5	6	7
...habe ich Lust Produkte spontan zu kaufen.	○	○	○	○	○	○	○
...beschreibt "just do it" die Art und Weise wie ich Produkte kaufe.	○	○	○	○	○	○	○
...beschreibt "Ich sehe es, ich kaufe es" die Art und Weise wie ich Produkte kaufe.	○	○	○	○	○	○	○
...habe ich Lust, Produkte zu kaufen, je nachdem, wie ich mich in diesem Moment fühle.	○	○	○	○	○	○	○
...habe ich Lust, meine Einkäufe sorgfältig zu planen.	○	○	○	○	○	○	○
...habe ich das Gefühl, ein bisschen leichtsinnig zu sein.	○	○	○	○	○	○	○
...möchte ich Produkte kaufen ohne nachzudenken.	○	○	○	○	○	○	○

Stellen Sie sich nun vor, Sie haben ein hypothetisches Budget von **20€** zur Verfügung, das Sie im folgenden simulierten Einkaufsszenario verwenden können.

Sie werden in weiterer Folge eine Auswahl an Produkten sehen. **Sie haben die Freiheit zu entscheiden, welche und wie viele Produkte Sie kaufen möchten. Sie haben auch die Möglichkeit keine Produkte zu kaufen.** Treffen Sie Ihre Entscheidungen nur so, als ob Sie tatsächlich vor den Regalen eines Geschäftes stehen würden.

Beachten Sie dabei, dass Ihr Budget ausschließlich auf die 20€ beschränkt ist!

Welche Produkte möchten Sie mit Ihrem Budget von 20€ kaufen?

Total: €0.00

☐ Socken €8.99

☐ Mütze €14.99

☐ Zigaretten €5.50

☐ Make-up Produkt €9.99

☐ Kartoffelchips €2.99

☐ Haarspange €4.99

☐ Duftkerze €2.29

☐ Duschgel €1.79

☐ Eiscreme €6.99

☐ Schokoladenkekse €2.29

☐ T-Shirt €12.99

☐ Pflanze €9.99

☐ Bodylotion €4.49

☐ Proteinriegel €1.19

☐ Schokolade €1.39

☐ Sweatshirt €19.99

☐ Blumenstrauß €12.99

☐ Wein €7.49

☐ Badeschaum €3.95

☐ Gummibärchen €1.49

Gürtel
€17.99

Tasse €4.99

Bier €1.29

Gesichtsmaske
€1.45

Nussmischung
€3.69

Demographics

Bitte wählen Sie Ihr Geschlecht aus den folgenden Optionen:

○ Weiblich

○ Männlich

○ Andere

Bitte geben Sie ihr Alter in Jahren an:

Debriefing message

Herzlichen Dank für Ihre Teilnahme!

Die gesammelten Daten werden vertraulich behandelt und ausschließlich für wissenschaftliche Zwecke verwendet. Sollten Sie Anmerkungen oder Fragen zur Umfrage haben, freuen ich mich auf Ihre Kontaktaufnahme unter laurasardest98@gmail.com.

Herzliche Grüße
Laura Sardest