INVESTING IN A DIGITAL ASSET ENVIRONMENT: THE EFFECTS OF STAFF ACCOUNTING BULLETIN 121 AND THE FEAR OF MISSING OUT

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Abstract

In recent years, regulators have become concerned that investors will be misled in the largely unregulated crypto-asset environment. Particularly, the U.S. Securities and Exchange Commission (SEC) has become concerned about the effects that the Fear of Missing Out (FoMO) could have on investors in the crypto-asset space (SEC, 2021a). This dissertation investigates, in an experimental setting, whether Staff Accounting Bulletin 121 (SAB 121) - recently issued financial reporting guidance by the U.S. Securities and Exchange Commission (SEC) - protects investors with higher levels of FoMO in the crypto-asset environment. Two experiments were carried out online through Prolific using a sample of 95 retail investors (Experiment 1) and 412 retail investors (Experiment 2). In Experiment 1, consistent with social psychology theory, I find that investors with higher levels of FoMO experience more negative emotions at the thought of missing out on future financial gains as they exhibit a higher propensity to invest in the crypto-asset market as compared to investors with lower levels of FoMO. I also find that exposure to SAB 121 decreases investors propensity to invest in the digital asset market with the effects being more pronounced for investors with higher levels of FoMO as compared to investors with lower levels of FoMO. Experiment 2 shows that SAB 121 decreases investors propensity to invest in the crypto-asset market by heightening their risk perception. I conclude the dissertation with a discussion of the implications of the findings for regulators, investors, and for accounting research.

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Chapter 1: Introduction

This dissertation considers the influence of Staff Accounting Bulletin No. 121 (hereafter referred to as SAB 121), a recently issued financial reporting guidance by the U.S. Securities and Exchange Commission (SEC), on investors' judgment and decision making. SAB 121 focuses on the technological, legal and regulatory risks associated with entities safeguarding clients' crypto-assets and maintaining the cryptographic key information necessary to access these assets (SEC, 2022a).[1] The guidance outlines specific changes to the financial reporting guidelines that entities safeguarding crypto-assets on behalf of third parties must undertake with the goal of providing additional information to investors to enable them to make more informed investment decisions (SEC, 2022a).

Since the inception of digital currency in 2009, the digital asset space has experienced substantial growth. To illustrate this, as of April 30, 2013, the popular CoinMarketCap reported a total market capitalization of cryptocurrencies of $1.7 billion USD. Whereas, as of March 2024, the total market capitalization has grown to $2.7 trillion USD (CoinMarketCap, 2024). Several industry experts have gone as far as to declare cryptocurrencies as a separate asset class and distinct from other more traditional asset classes such as equities (e.g., stocks), fixed income (e.g., bonds), cash and cash equivalents, real estate, commodities, and currencies (Goldman Sachs, 2021). Further highlighting the growth of the crypto-asset space are recent investments by

[1] The cryptographic key is a private key (i.e., a string of letters and numbers) that acts like a password and unlocks the virtual vault that holds an investor's crypto-assets.

several large, publicly listed corporations such as Tesla, MicroStrategy and Block, Inc. (formerly Square, Inc).[2]

Given the growth of the crypto-asset industry in recent years, addressing the effects of SAB 121 on investors is important for several reasons. The U.S. Securities and Exchange Commission (SEC) has a three-part mission which includes: "to protect investors, maintain fair, orderly, and efficient markets, and facilitate capital formation" (SEC, n.d.). Consistent with its mission, the SEC created SAB 121 as a result of various recent scandals associated with crypto-asset exchanges.[3] The SEC justified the need for SAB 121 by citing an October 2020 Report of the Attorney General, which in turn cites a public report that estimates that at least $1.7 billion of cryptocurrencies were stolen or scammed in 2018, with over $950 million of this amount stolen from cryptocurrency exchanges.[4] These statistics highlight the lack of appropriate regulation and monitoring of crypto-asset exchanges which poses a threat to crypto-asset users and the general public. Ultimately, and consistent with the SEC's mandate, the objective of SAB 121 is to enhance the information received by investors to assist them in making investment and other capital allocation decisions (SEC, 2022a).

Regulators are particularly concerned that investors will be misled in the largely unregulated digital asset environment (Phillips, 2021). In recent years, the SEC has taken a proactive approach to the regulation of transactions within the crypto-asset

[2] For example, on January 2021, Tesla purchased the equivalent of $1.5 billion USD in Bitcoin (Irrera & Wilson, 2021) while, as of 2022, MicroStrategy has purchased an aggregate of 129,699 Bitcoin at an average price of approximately $30,665 USD per bitcoin (Milton, 2022).
[3] For example, the SEC filed legal action against BitConnect, an online crypto lending platform, and its associated top management alleging that BitConnect had defrauded retail investors out of $2 billion USD through a global fraudulent and unregistered offering involving digital assets (SEC, 2021b). Coincheck, one of the largest digital currency exchanges in Japan suffered a cyber-attack on its network and reportedly lost $534 million worth of virtual assets (BBC World, 2018). It is estimated that investors have lost hundreds of millions of dollars from the hacks of the following exchanges: Bitstamp, Bitfinex, Parity, and NiceHash (Cunha & Murphy, 2019).
[4] The October 2020 Report of the Attorney General is available at: https://www.justice.gov/ag/page/file/1326061/download.

environment. The SEC's concerns pertaining to the crypto-asset environment stem from the fact that crypto-assets are an emerging technology that attracts relatively large sums of money and that has the potential for fraud and abuse (Goforth, 2020). In 2013, the SEC issued its first warning about the crypto-asset environment when it published a press release stating that some virtual currencies had been used in a Ponzi scheme (SEC, 2013). In mid-2014, the SEC issued an investor alert cautioning potential investors about extensive risks associated with virtual currency-related investments (SEC, 2014). More recently, the SEC issued a press release stating that they were charging Samuel Bankman-Fried with defrauding investors through the crypto-asset trading platform FTX (SEC, 2022b). Since its first press release warning in 2013, the SEC has continued to warn potential investors of the risks associated with the crypto-asset space with one of the most recent Investor Alerts and Bulletins urging investors to exercise caution in the crypto-asset environment given that "Investments in crypto asset securities can be exceptionally volatile and speculative, and the platforms where investors buy, sell, borrow, or lend these securities may lack important protections for investors" (SEC, 2023a).

Particularly, in the recent past, the SEC became concerned about the effects that the Fear of Missing Out (FoMO) could have on investors in the crypto-asset space (SEC, 2021a). In 2021, the SEC published an investor alert and bulletin cautioning digital asset investors experiencing FoMO to "take the time to understand how the investment works and to evaluate its risks prior to making digital asset investment decisions" (SEC, 2021a). In a social context, the Fear of Missing Out (FoMO) is a personality trait grounded in psychological theory (Baumeister & Leary, 1995; Deci & Ryan, 1985;

Reagle, 2015) that has been defined as "a pervasive apprehension that others might be having rewarding experiences from which one is absent and is characterized by the desire to stay continually connected with what others are doing" (Przybylski, Murayama, DeHaan, & Gladwell, 2013, p. 1841). FoMO is characterized by an individual's desire to stay continually connected with what others are doing. However, in an investing context, FoMO has been conceptualized differently than in the traditional social context as it highlights an individual's propensity to experience negative emotions (e.g., fear and anxiousness) associated with missing out on a potential monetary reward (Clor-Proell, Guggenmos, & Rennekamp, 2020)[5]. Recent research suggests that FoMO has been a major driving force behind a segment of the population's financial trading behaviour as stories of enormous financial gains have become commonplace in news and social media (Hershfield, 2020; Reinicke, 2021). Consistent with the core foundations of behavioural economics, prior research has focused on the effect of FoMO on financial decision making (Hershfield, 2020) and investment decisions (Shiva, Narula, and Shahi 2020).

This dissertation attempts to address the following three primary research questions: (1) Do investors with higher levels of FoMO have a higher propensity to invest in the crypto-asset environment? (2) Does exposure to SAB 121 decrease investors' risk-taking behaviour in a crypto-asset environment? (3) Does exposure to SAB 121 protect the more vulnerable group of investors with higher levels of FoMO?. To examine these research questions, I conduct two experiments. An experimental

[5] Herding behaviour is closely associated with FoMO as it involves following what other investors are doing with the goal of not missing out. For instance, some investors follow herd behaviour in an attempt to reduce losses and increase profits (Gupta & Shrivastava, 2021).

methodology allows me to manipulate the presence/absence of SAB 121 while holding other financial conditions constant. Using an experimental methodology also allows me to compare varying levels of investors' FoMO and to focus on investors with high levels of FoMO – a group of investors about which the SEC has expressed concerns (SEC, 2021a).

In Experiment 1, ninety-five subjects (95) retail investors [6] report their willingness to invest in a hypothetical crypto-asset exchange based on their evaluation of financial information pertaining to the crypto-asset exchange. The financial information mainly comprises stock price updates related to a fictitious crypto-asset exchange throughout a stock market trading day. Furthermore, random assignment of participants results in some participants reading - in the financial information provided - a disclosure consistent with SAB 121 (treatment condition) while in the control condition, the disclosure is not presented to participants. After participants report their willingness to invest in the fictitious crypto-asset exchange, I measure participants level of FoMO using a 10-item Investment Fear of Missing Out (I-FoMO) scale documented and validated by Clor-Proell et al. (2020). Building on Experiment 1, I perform Experiment 2 with the objective of elucidating the mechanism to explain why SAB 121 impacts high FoMO investors' judgment and decision making but not low FoMO investors.[7] Given the higher level of complexity in the theoretical model being tested in

[6] Retail investors are individual, non-professional investors that buy and sell investments through either traditional, online brokerage firms, or other types of investment accounts. Retail investors traditionally trade in smaller amounts as compared to institutional investors which are normally managed by professional portfolio and fund managers.

[7] Experiment 2 also serves the purpose of replicating the results of Experiment 1 to increase the reliability of the results obtained. Given recent concerns about the replicability of research findings in many disciplines (e.g., Camerer et al., 2018; Simmons, Nelson, & Simonsohn, 2020) the scientific community has emphasized the importance of carrying out replication studies to assert whether the original findings can be relied upon (Brandt et al., 2014; Camerer et al., 2018).

Experiment 2 coupled with the need for higher levels of statistical power, the final sample size was four-hundred and twelve (412) participants.

Consistent with the fundamental understanding that investors with higher levels of FoMO experience more negative emotions (i.e., fear, worry, bother, and anxiousness) at the thought of missing out on investment information, the experimental results show that participants with a high level of FoMO exhibited a higher propensity to invest in the fictitious crypto-asset exchange as compared to investors with lower levels of FoMO. In addition, I find that exposure to SAB 121 significantly decreases investors' propensity to invest in the shares of the crypto-asset exchange. More specifically, SAB 121 is found to be an effective attenuator to the effect of FoMO on investors' propensity to invest given that for investors with low levels of FoMO, the presence or absence of SAB 121 has no effect on their propensity to invest in the shares of the crypto-asset platform whereas for investors with higher levels of FoMO, the presence of SAB 121 significantly reduces their propensity to invest. However, I do not find that at higher levels of FoMO, participant's risk perception of investing in the crypto-asset platform mediates the relationship between SAB 121 and willingness to invest. Having said this, follow-up exploratory analysis reveals that the reason why the presence of SAB 121 decreases investors propensity to invest in the shares of the crypto-asset platform is due to a heightened risk perception. Overall, this is consistent with the idea that the risk disclosures associated with SAB 121 increase investors' risk perception.

This dissertation contributes to emerging research in the disciplines of accounting, psychology, and management surrounding FoMO. Although the term FoMO applies mainly to social contexts, concerns about the fear of missing out have began to

appear more frequently in investment contexts (Clor-Proell et al., 2020; Potsaid & Venkataraman, 2022). This dissertation presents one of the earliest tests of the I-FoMO metric. Furthermore, although the popular press attributes the recent surge in retail investor trading to FoMO (Hicks, 2021; Laurent, 2021), limited empirical evidence exists as to whether FoMO affects investors' behaviour. As such, this study provides supporting evidence to establish the association between FoMO and investor behaviour (Clor-Proell et al., 2020; Shiva et al., 2020; Gupta & Shrivastava, 2022; Argan et al., 2023; Potsaid & Venkataraman, 2022). Furthermore, although in a social context, several methods have been proposed to mitigate the effects of FoMO (e.g., Santos, Freire, Zugliani, Cirillo, Santos, Nardi, & King, 2016; Alutaybi, Al-Thani, McAlaney, & Ali, 2020), the management literature lacks an empirically supported method for attenuating the effect of FoMO on investors' judgment and decision making. In this dissertation, I provide empirical evidence that shows that presenting investors with disclosures consistent with SAB 121 can act as an effective FoMO reduction tool in an investment setting.

This study is also of interest to policy makers. Given that SAB 121 was issued by the SEC to aid investors' capital allocation following several crypto-exchange scandals, understanding the effectiveness of SAB 121 would be of interest to the SEC and other policy makers. Given that the SEC has voiced their concerns over the effects that FoMO could have on digital asset investors (SEC, 2021a), this study provides empirical evidence as to whether accounting regulation could mitigate these effects and ultimately protect investors. In addition, this study contributes to research related to digital asset

financial reporting, an area within the academic accounting literature with limited number of publications (Pimentel & Boulianne, 2020).

The remainder of this dissertation is structured as follows. In Chapter 2, I provide the context that gave rise to SAB 121. In Chapter 3, I perform a literature review of FoMO in both the social and investment contexts. In Chapter 4, I discuss the theory and develop the hypotheses. In Chapter 5, I describe the experimental methodology for Experiment 1 and Experiment 2. In Chapter 6, I present the results of the test of hypotheses for Experiment 1 and Experiment 2. In Chapter 7, I present a discussion of the results, implications, limitations, and future research opportunities.

Chapter 2: The Security Exchange Commission and Staff Accounting Bulletin 121

2.1 Overview

The purpose of this chapter is to understand why the SEC created SAB 121. It is important to understand this given that we must first understand the objective of SAB 121 to determine if its purpose of assisting investors in making investment decisions was met.

This chapter is organized as follows. In Section 2.2, I document the mission of the SEC and how they have used regulations to address their goals. In Section 2.3, I examine the SEC's regulatory approach to crypto-assets. In Section 2.4, I discuss how the custody of crypto-assets differs from the custody of other assets and the objective and intricacies of SAB 121. Finally, in Section 2.5, I consider how the SEC's concerns about investors FoMO are associated with SAB 121. Section 2.6 provides the conclusions of the chapter.

2.2 SEC Regulations

Following the stock market crash in October 1929, the U.S Congress passed the Securities Act of 1933. The following year, the Congress passed the Securities Exchange Act of 1934 which created the U.S. Securities and Exchange Commission (SEC) (SEC, n.d.). The SEC has a three-part mission which includes: "to protect investors, maintain fair, orderly, and efficient markets, and facilitate capital formation" (SEC, n.d.). To accomplish its mission, the SEC oversees the federal securities laws based on the concept that "everyone should be treated fairly and have access to certain facts about investments and those who sell them" (SEC, 2023b). For this reason, the SEC protects investors by "vigorously enforcing the federal securities laws to ensure truth and

fairness" (SEC, 2023b). The SEC also provides investors with resources necessary to evaluate their investment choices and protect them against fraud (SEC, 2023b). Below, I provide examples of regulations issued by the SEC in the recent past designed to protect investors in their investment and capital allocation decisions.

Regulation Fair Disclosure (FD), for example, prohibited firms from disclosing information to investors before the public (SEC, 2000). This benefited investors because selective disclosure "places them at a severe disadvantage in the market" (SEC, 2000). Another regulation that the SEC enacted was requiring companies to provide financial statement information in an interactive data format using the eXtensible Business Reporting Language (XBRL). One of the primary objectives of this regulation was to improve the usefulness of the financial information to investors (SEC, 2009). More recently, the SEC has required firms to hyperlink exhibits with the expected benefits including "more effective monitoring" and "more informed investment and voting decisions" (SEC, 2017, p. 25).

2.3 SEC Approach to Crypto Exchange Regulation

Given regulators increased concern with crypto-assets (Phillips, 2021), the SEC published several press releases and investor alerts warning potential crypto-asset investors of the risks involved. In 2013, the SEC issued its first warning about the crypto-asset environment when it published a press release stating that some virtual currencies had been used in a Ponzi scheme (SEC, 2013). In mid-2014, the SEC issued an investor alert cautioning potential investors about extensive risks associated with virtual currency-related investments (SEC, 2014). Since its first warning press release in 2013, the SEC has continued to warn potential investors of the risks associated with the

crypto-asset space with one of the most recent Investor Alerts and Bulletins urging investors to exercise caution in the crypto-asset environment given that "Investments in crypto asset securities can be exceptionally volatile and speculative, and the platforms where investors buy, sell, borrow, or lend these securities may lack important protections for investors" (SEC, 2023a). The SEC's concerns for the crypto-asset ecosystem are evident based on the various Investor Alerts and Bulletins published to date and were validated by the FTX scandal whereby Gary Gensler, the SEC Chair, stated that "The alleged fraud committed by Mr. Bankman-Fried is a clarion call to crypto platforms that they need to come into compliance with our laws" (SEC, 2022b).

An emerging area of concern to the SEC is how entities offering custodial services to clients should account for crypto-assets that the entity is holding on behalf of their clients (SEC, 2022a). This issue is particularly important given the various hacks, breaches, and other thefts that have occurred in recent times in crypto-asset platforms such as Binance, Cryptopia, and QuadrigaCX (Smith, 2021). An October 2020 Report of the Attorney General, which in turn cited a public report estimated that at least $1.7 billion of cryptocurrency was stolen or scammed in 2018, with over $950 million of that amount stolen from cryptocurrency exchanges. These statistics highlight the lack of appropriate regulation and monitoring of crypto-asset exchanges which poses a threat to cryptocurrency users and the general public. This, in part, has prompted the SEC to issue SAB 121 which, consistent with its mandate, aims to protect investors by highlighting technological, legal, and regulatory risks associated with the safeguarding of crypto-assets and thereby "assisting them [potential investors] in making investment and other capital allocation decisions" (SEC, 2022a).

2.4 Custody of Crypto-Assets

To store digital assets such as Bitcoin, network users are required to hold a cryptocurrency wallet. Cryptocurrency wallets are essentially the private and public keys associated with a network participant. Wallets contain one or more private keys which are mathematically related to the addresses generated for the wallet. The private keys are the most valuable element of wallets as these keys can be used to transfer crypto-assets from peer to peer. There exist various types of wallets categorized as software wallets, hardware wallets, and paper/brain wallets (Guri, 2018). Although within these three categories there are various sub-categories, software wallets are of particular interest given their relevance to SAB 121. Software wallets are applications that store both the private and public keys. Although there exist various types of software wallets including client-side wallets, web-based wallets, watch-only wallets and cold ('air gapped') wallets, of particular interest are web-based wallets. These wallets are managed by third parties and can be accessed by users via online websites. The private keys in these types of wallets are stored in the provider's database and are not visible to the client side (Guri, 2018). Upon an investor purchasing a digital asset on an exchange, the cryptocurrency is automatically stored in an exchange-hosted wallet where the exchange has control of the private keys. Unless the user withdraws the funds from the exchange-hosted wallet (e.g., a hardware wallet), the exchange retains control of the private keys.

In the traditional banking system, custodians are required by law to be financial institutions and, in some cases, physically store these assets (Sandor, 2023). However, in the digital asset space, custodians do not technically store any of the assets given that the transactions exist on the blockchain (i.e., a public ledger) (Sandor, 2023). As such,

in the crypto-asset space, custodians safeguard users' private keys which is the vital part of the crypto-asset wallet that grants holders access to the funds held within it.

2.4.1 Staff Accounting Bulletin No. 121

On March 31, 2022, the Division of Corporation Finance and the Office of the Chief Accountant of the U.S. Securities and Exchange Commission (SEC) issued Staff Accounting Bulletin No. 121 (SAB 121), which "adds interpretive guidance for entities to consider when they have obligations to safeguard crypto-assets held for their platform users." (SEC, 2022a). SAB 121 is applicable to "entities that file reports pursuant to Sections 13(a) or 15(d) of the Securities Exchange Act of 1934 ("Exchange Act") and entities that have submitted or filed a registration statement under the Securities Act of 1933 ("Securities Act") or the Exchange Act that is not yet effective. SAB 121 is also applicable to entities submitting or filing an offering statement or post-qualification amendment thereto under Regulation A, entities subject to the periodic and the current reporting requirements of Regulation A, and private operating companies whose financial statements are included in filings with the SEC in connection with a business combination involving a shell company, including a special purpose acquisition company." (SEC, 2022a). Existing registrants must apply SAB 121 to financial statements, as applicable, to both interim and annual periods ending after June 15, 2022, with retrospective application required to at least the beginning of the fiscal year.

SAB 121 contains guidance which specifically focuses on the technological, legal, and regulatory risks associated with entities safeguarding clients' crypto-asset(s) and maintaining the cryptographic key information necessary to access the crypto-asset. In

addition, entities are required to make the following additions and disclosures in their financial statements:

- Disclose an asset and a liability on the balance sheet to reflect their obligation to safeguard the crypto-assets held for its platform users. Both the asset and liability should be initially measured at initial recognition and each reporting date at the crypto-assets fair value of the digital assets held for its platform users, and
- Disclose in the notes to the financial statements, the nature and amount of crypto-assets that the entity is responsible for holding for its platform users with a separate disclosure for each crypto-asset and the vulnerabilities that entities have due to these activities, and
- Disclose in the notes to the financial statements how the fair value of the asset and liability associated with the digital assets was derived, and
- Entities should also consider disclosures about the company, its agent, and/or third party that holds the cryptographic key information, maintains the internal recordkeeping of those assets, and is obligated to secure the assets, and
- Entities may be required to disclose outside the financial statements under existing Commission rules, the description of business, risk factors, or management's discussion and analysis of financial condition and results of operation. This includes an analysis of legal ownership of the crypto-assets including whether the entity would be available to satisfy general creditor claims in the event of a bankruptcy, and
- Lastly, entities may need to provide disclosure of the potential impact that the destruction, loss, theft, or compromise or unavailability of the cryptographic key

information would have to the ongoing business, financial condition, operating results, and cash flows of the entity.

Based on reports by Bloomberg, SAB 121 would be applicable to various publicly listed corporations (Iacone, 2022). Corporations such as Robinhood Markets Inc., Coinbase Global Inc. (Coinbase), PayPal Holdings Inc., and Block Inc. (formerly Square Inc.) could see their balance sheet affected by the newly issued SEC regulation. Although SAB 121 is a SEC Staff Accounting Bulletin which does not carry the same weight as a formal regulation, corporations normally follow SEC accounting instructions, and auditors will expect their clients to comply with it (Iacone, 2022). Appendix A contains the formal SAB 121 regulation as published by the SEC.

2.5 SEC Investor Alerts and Bulletins Contemporary to SAB 121

As noted in the previous section, the SEC issued SAB 121 on March 31, 2022. In order to figure out the type of investors the SEC was targeting through SAB 121, it is imperative to understand the SEC's concerns associated with the digital asset space at the time of SAB 121's issuance. During this time, the SEC became concerned with how investor's fear of missing out (FoMO) impacts their investment judgment when making decisions about potential investments in the crypto-asset space. Below, I review two Investor Alerts and Bulletins issued by the SEC that highlight the SEC's concern with FoMO and crypto investments.

2.5.1 SEC's Investor Alert - September 2021

On September 2021, the SEC published an investor alert associated with digital asset investment scams (SEC, 2021a). The alert cautioned crypto-asset investors of scams in the digital asset space which often result in devastating losses. More

specifically, the SEC noted that investors with FoMO may be less skeptical of investment opportunities in the crypto-asset space given they may feel that they "will miss an opportunity to become very wealthy" (SEC, 2021a). As a result, in the alert, the SEC recommended investors experiencing FoMO to "take the time to understand how the investment works and to evaluate its risks" prior to making digital asset investment decisions (SEC, 2021a).

2.5.2 SEC's Investor Alert - August 2022

On August 2022, the SEC published an investor alert associated with social media investment frauds (SEC, 2022c). The alert cautioned investors of the possible dangers associated with relying on investment information available on social media. As the alert states: "Social media allows fraudsters to contact many people quickly, cheaply, and without much effort – and it is easy for fraudsters to post information on social media that looks real and credible." (SEC, 2022c). More specifically, the SEC noted that a common crypto-asset investment scam occurs when fraudsters exploit investors' FoMO to lure them on social media into crypto investment scams.[8]

2.6 Conclusion

In this chapter, I provided background information to understand the SEC's justification for issuing SAB 121. The SEC's mission includes protecting investors, maintaining an efficient market, and facilitating capital formation. Based on investor alerts, the SEC is concerned about the risks to investors involved in the crypto-asset environment. Following various hacks, breaches, and thefts of crypto-assets from crypto

[8] For example, in a 'Pump and Dump' scheme, fraudsters may pump up the price of an asset making false and misleading statements on social media to create a buying frenzy, and then sell the asset at the pumped-up price (Barnes, 2018).

exchanges, the SEC issued SAB 121 which aims to protect investors by highlighting technological, legal, and regulatory risks specifically associated with the safeguarding of crypto-assets.

Based on more recent investor alerts that are contemporary to the SEC's issuance of SAB 121, the SEC is concerned about the effects that the Fear of Missing Out (FoMO) could have on investors in the crypto-asset environment (SEC, 2021a; SEC, 2022c). As such, the SEC is convinced that investors with high levels of FoMO invest in the crypto-asset environment and issued SAB 121 as a tool to aid investors in their capital allocation decisions. Given the importance of FoMO to the SEC and its negative effects on investors judgment and decision making, in the next chapter, I review the psychology and management literature pertaining to FoMO.

Chapter 3: FoMO and Investment Decisions

3.1 Overview

The purpose of this chapter is to provide a theoretical foundation to understand how the phenomenon of FoMO applies to the investing context and influences investors' decision making. It is important to understand this given that we must first understand what FoMO is before we can understand whether SAB 121 would be an effective attenuator of FoMO. To accomplish this chapter's objectives, I review past psychology and management research in the area of FoMO including empirical evidence associated with mitigating FoMO.

This chapter is organized as follows. In Section 3.2, I examine theories that explain non-rational behaviour in individuals and present FoMO as a psychological trait that explains specific types of non-rational behaviour. Furthermore, in this section, I review FoMO mitigation techniques from the psychology literature. In Section 3.3, I discuss FoMO in an investing context and review FoMO mitigation techniques proposed by financial regulators. Section 3.4 provides the conclusions of the chapter.

3.2 Psychological Literature on FoMO

3.2.1 Non-Rational Behaviour

In the 19th century, John Stuart Mill introduced the concept of *homo economicus* or rational economic man who attempts to maximize his utility [9] given the constraints he faces (Mill, 1874). The three underlying assumptions of *homo economicus* are: (1) agents are rational, (2) agents consider all information available prior to making an

[9] In the expected utility theory, utility was considered to be a measure of satisfaction of individuals by consuming a good or a service (Bernoulli, 1954).

investment decision, (3) decision makers always pursue their self-interest. These three assumptions are the foundation of traditional financial theories including Markowitz Portfolio Theory (Markowitz, 1952) and the Efficient Market Hypothesis (Fama, 1970).

Historically, the prevailing theory for investment decision making under risk was Expected Utility Theory (Bernoulli, 1954) which posits that agents make decisions under uncertainty by comparing the expected utility values of the available options. Agents attempt to maximize their expected utility which is calculated as the weighted sum of utility values multiplied by their own probabilities. Underlying Expected Utility Theory is the idea that individuals are rational and will thus make the decision that provides the highest benefit. The challenge with traditional financial theories is that they were unable to explain disruptions in stock markets including bubbles and market over or under reactions (Kapoor & Prosad, 2017). Due to the inability of traditional theories to explain these anomalies, behavioural economics was born to provide behavioural explanations to such market anomalies and disruptions. Expectancy Theory which was created by Vroom (1964) and developed by Kahneman and Tversky (1979) emphasized that individuals do not always act in a rational manner. Kahneman and Tversky (1979) introduced the concept of Prospect Theory for analyzing decision making under uncertainty. Prospect theory is comprised of three major propositions: (1) Individuals do not have a uniform risk attitude, (2) Individuals estimate the value of a prospect with the help of a reference point, (3) Losses have a greater effect on preferences than gains.

Empirical research has supported the theoretical proposition of Expectancy Theory and Prospect Theory revealing that individuals do not always behave rationally (Camerer & Loewenstein, 2004; Tekin, 2016; Hidajat, Primiana, Rahman, & Febrian,

2020). As such, investors' judgment and decision making has been a major area of interest in behavioural finance which has led to researchers examining factors that affect individuals' investment decision making. This dissertation specifically considers the relationship between FoMO and financial behavior which in recent years has received significant attention from researchers and practitioners (Clor-Proell et al., 2020; Potsaid & Venkataraman, 2022).

3.2.2 FoMO – An Explanation for Non-Rational Decision Making

Fear of Missing Out (FoMO) is a term introduced in 2004 that has gained popularity since 2010 and describes a phenomenon observed on social media (Gupta & Sharma, 2021). FoMO is a personality trait grounded in psychological theory (Baumeister & Leary, 1995; Deci & Ryan, 1985; Reagle, 2015) that has been defined as "a pervasive apprehension that others might be having rewarding experiences from which one is absent and is characterized by the desire to stay continually connected with what others are doing" (Przybylski et al., 2013, p. 1841). FoMO is thus an individual's tendency to engage in comparisons with others which may thereby lead them to make decisions that can be considered irrational.

FoMO is based on self-determination theory (SDT) (Ryan & Deci, 2000) - a macro-theory of human motivation – which was later applied by Przybylski et al (2013) to understand what drives FoMO. SDT is grounded on the idea that three innate and universal psychological needs motivate individuals to grow and change. These include: (1) competence – the ability to successfully act on the world, (2) autonomy – self authorship or personal initiative, and (3) relatedness – closeness or connectedness and the feeling of attachment and belonging with others. According to Przybylski et al

(2013), FoMO is a negative emotional state resulting from unmet social relatedness needs.

FoMO can be a transitory, long-term or a permanent feeling as it could occur in mid-conversation, as a long-term disposition, or it can be a state of mind that leads a person to feel a deeper sense of social inferiority, loneliness, or intense rage (Gupta & Sharma, 2021). The feeling of FoMO includes two processes: the individual first has the perception that they are missing out which is later followed by compulsive behavior to maintain social connections (Gupta & Sharma, 2021).

The concept of FoMO has been applied to missing out on a variety of rewarding experiences including purchasing consumer products (Good & Hyman, 2020), playing video games (Freire & Santos, 2020), and realizing financial gains (Laurent, 2021). Furthermore, FoMO has gained widespread attention in the psychology literature and the general press for its connection with social media and negative health outcomes. For example, empirical research has shown associations between FoMO and increased depressive and anxiety symptoms (Baker, Kreiger, & LeRoy, 2016; Wolniewicz, Tiamiyu, Weeks, & Elhai, 2018), increased risk of “addictive technological behaviors” (O'Connell, 2020), and increased risk of dangerous behaviors such as texting and driving (Dossey, 2014; Lee, Champagne, & Francescutti, 2013).

In recent years, the incidence of FoMO has increased, mainly due to the widespread use of the internet feature of smart phones (Tanhan, Özok, & Tayiz, 2022). Individuals that are low in basic need satisfaction due to unmet social relatedness are prone to gravitate towards the usage of social media as this gives them a sense of being in touch with others and an opportunity to deepen social ties (Przybylski et al., 2013).

3.2.3 Mitigating FoMO

The field of psychology has done significant research on different mechanisms to mitigate the effects of social FoMO. The treatment goals for combating FoMO focus on controlling the symptoms rather than abstaining from the FoMO inducing activity (Gupta & Sharma, 2021). The current, and preferred treatment choice is centered around the principles of cognitive behaviour therapy (CBT) to address the underlying anxiety associated with FoMO and focus on the predisposing factors (Santos, Freire, Zugliani, Cirillo, Santos, Nardi, & King, 2016). As well, it addresses distorted cognitions which are thought to be one of the drivers of the development and maintenance of FoMO (Alutaybi et al., 2020).

FoMO Reduction (FoMO-R) has been reported as a novel method for managing the condition (Alutaybi et al., 2020). FoMO-R encompasses a group of interventions that provides information to those with FoMO, and more specifically, attempts to warn or eliminate their compulsive behavior in the particular situation where it is found (Alutaybi et al., 2020).[10]

In addition to FoMO-R, other studies have tested other innovative methods of decreasing and minimizing traditional FoMO. One study reflected on how social network sites can be better designed to aid individuals in managing their feelings of FoMO (Alutaybi, McAlaney, Stefanidis, Phalp, & Ali, 2018). For instance, the authors suggested that filtering – a technique used to only display information that people are interested in – can be an effective countermeasure to reduce FoMO. Another exploratory study assessed interventions that could decrease FoMO in the WhatsApp

[10] FoMO-R has been reported as a safe alternative to anxiolytic drugs and has been empirically shown to help individuals manage their FoMO (Alutaybi et al., 2020; Gupta & Sharma, 2021).

environment (Wiesner, 2017). The study considered a variety of interventions such as colouring the edges of the WhatsApp screen based on the user's behaviour so that when the user starts to show compulsive behaviour, the edges slowly turn red given the idea that the red colour indicates that "something is wrong". Among other interventions assessed, the author examined whether self-closing the WhatsApp chat after the app recognizes compulsive behaviour would mitigate FoMO. However, the study concluded that the type of intervention does not have too much influence on the symptoms associated with FoMO. Lastly, another study examined an emotion awareness intervention to help individuals become more aware of their emotions after using social media through a set of reflection questions and guiding prompts (Chen, Chang, Huang, Hsu, Lin, & Kuo, 2022). The authors found that the proposed intervention helped participants reduce social media use and thus FoMO.

3.3 FoMO in the Investment Context

3.3.1 Background and Definition

Prior research has demonstrated that conceptually FoMO in a social context differs substantially from FoMO in an investing context. Clor-Proell et al. (2020) noted a fundamental difference between traditional FoMO, and individuals fear of missing out on investment information (I-FoMO). Whereas for traditional FoMO the outcome is psychological well-being, for I-FoMO it is the potential monetary reward (Clor-Proell et al., 2020). In addition, traditional FoMO and I-FoMO may not always be correlated to one another if an individual places a high value on social experiences but not on monetary experiences or vice versa (Kasser & Ryan, 1993). As such, I-FoMO as a construct, highlights individual's propensity to experience negative emotions (e.g., fear

and anxiousness) pertaining to missing out on a potential monetary reward (Clor-Proell et al., 2020). In addition, it has been suggested that individuals higher in I-FoMO have different personality characteristics, and likely different behaviours, as compared to individuals higher in traditional FoMO given the correlations of the two constructs with the Big-Five personality dimensions (Clor-Proell et al., 2020)[11]. Prior research has shown that whereas traditional FoMO is significantly negatively correlated with emotional stability and conscientiousness (Stead & Bibby, 2017), I-FoMO is significantly positively correlated with conscientiousness (Clor-Proell et al., 2020).[12]

In recent years, FoMO has been a major driving force behind a segment of the population's financial trading behaviour as stories of enormous financial gains have become commonplace in news and social media (Hershfield, 2020; Reinicke, 2021). Furthermore, concerns about the fear of missing out in investing settings have began appearing more frequently in the finance and accounting academic literature (e.g., Clor-Proell et al., 2020; Potsaid & Venkataraman, 2022). However, academic studies of FoMO in the finance and accounting literature are still limited (Argan, Altundal, & Tokay Argan, 2023).

3.3.2 FoMO in the Management Literature

As suggested by the previous section, academic studies examining FoMO in financial settings are limited. However, in the recent past, management scholars have begun to acknowledge the power of FoMO in influencing human and - more specifically

[11] The Big-Five personality traits are a grouping of five basic factors used to describe most personality traits. These five factors include Neuroticism, Openness to Experience, Extraversion, Agreeableness, and Conscientiousness. Researchers have used these five traits to predict individual differences in numerous settings (Roccas, Sagiv, Schwartz, & Knafo, 2002).
[12] As a result of the differences between traditional FoMO and I-FoMO, Clor-Proell et al., (2020) developed and validated a scale for measuring Fear of Missing Out on Investment Information (I-FoMO) and demonstrated its distinctiveness from the scale developed by Przybylski et al. (2013) to measure FoMO in social settings.

– investor behaviour. In an investing setting, FoMO can lead investors to feel that others are making profits, and to trade in the relevant markets to avoid missing out on potential financial gains (Hershfield, 2020). There are five notable studies that have recently examined I-FoMO, each of which will be discussed in turn.[13] Table 1 provides a tabular summary of these articles.

Author	Participants	Methodology and Measurement of I-FoMO	Major Findings
Clor-Proell et al., (2020)	- 178 Nonprofessional investors	- Experimental design - I-FoMO was captured via a scale the authors validate	- Receiving ungrouped content via a mobile device has a greater effect on investment allocations in the presence, rather than absence, of push notifications with results holding for high I-FoMO (but not low I-FoMO) investors.
Shiva, Narula, & Shahi (2020)	- 265 retail investors	- Survey design - I-FoMO was captured via an adaptation of the scale developed by Clor-Proell et al., (2020) and Przybylski et al. (2013)	- I-FoMO was found to mediate the relationship between nomophobia and retail investor behaviour. Nomophobia is a psychological condition where an individual experiences anxiety and fear when they lack connectivity to their mobile device. - Retail investors tended to overtrade when they were in a state of fear of no investment information
Gupta & Shrivastava (2022)	- 323 Retail investors of Indian stock market	- Survey design - FoMO was measured based on items developed from	- Investment decisions of retail investors were significantly influenced by FoMO.

[13] Although FoMO pertaining to financial related activities is only a recent area of interest to management scholars, financial economists have recognized the importance of FoMO for some time with the field of economics viewing FoMO as a broad sentiment or herding that could cause financial market bubbles (DeMarzo, Kaniel, & Kremer, 2008; Bursztyn, Ederer, Ferman, & Yuchtman, 2014).

		prior studies including Dennison (2018), Kang et al. (2020), Shiva et al. (2020), Tarjanne (2020)	- FoMO partially mediated the relationship between loss aversion and herd behaviour on investor's investment decisions such that FoMO increased the influence of these variables on investor's behaviour
Argan et al. (2023)	- 1,741 participants who are 18 years of age and reported financial saving or individual investment	- Survey design - FoMO was measured using 10 items adopted from Przybylski et al. (2013)	- FoMO was found to be an antecedent factor for investment decisions among potential individual investors. - FoMO can be a construct that explains the indirect relationship between envy and financial decision-making behavior among individuals
Potsaid & Venkataraman (2022)	- 209 participants with experience trading stocks on online trading platforms	- Experimental design - I-FoMO was captured via the scale developed by Clor-Proell et al., (2020)	- High I-FoMO investors reacted more negatively to trading restrictions than low I-FoMO investors but were relatively less affected by non-gains versus non-losses.

Table 1: Studies investigating the relationship between I-FoMO and investors' decision making.

Below, I analyze the relevant insights from the studies listed on Table 1.

Clor-Proell et al., (2020) researched the interactive effect of the presence/absence of push notifications, the grouping/ungrouping of information and the level of I-FoMO on individual's investment behaviour. Push notifications referred to messages that smartphone applications send users to alert them about the arrival of new information - in-real time - regardless of whether the application is open. The grouping/ungrouping of information refers to whether the information received by the smartphone user is separated into pieces or is grouped together. After carrying out the

experiment, the researchers found that receiving ungrouped content via a mobile device had a greater effect on investment allocations in the presence, rather than absence, of push notifications. Furthermore, the authors found that these results held for high I-FoMO investors but not for low I-FoMO investors.

Shiva, Narula, & Shahi (2020) investigated the effect of nomophobia (i.e., the anxiety syndrome related to the non-availability of the mobile phone) and FoMO on investment decisions. FoMO was found to mediate the relationship between nomophobia and retail investor behaviour. The authors found that retail investors tended to overtrade when they were in a state of fear of no investment information. In a parallel study, Gupta & Shrivastava (2022) found that Indian stock market investors' behaviour was also influenced by FoMO. The authors noted that FoMO partially mediated the relationship between loss aversion and herd behaviour on investors' investment decisions such that FoMO increased the influence of these variables on investor's behaviour. Argan et al. (2023) showed that FoMO toward individual investment instruments (such as foreign currency, gold, stocks) is an antecedent factor for investment decisions among potential individual investors.

Potsaid and Venkataraman (2022) investigated how retail investors react to trading restrictions. In their experimental design, investors learned, while attempting to purchase a stock, that their brokerage had suspended buy orders. The authors manipulated whether the stock price increased or decreased following the restriction. When the stock price increased, investors miss out on a potential gain while when the stock price decreased, investors avoided a potential loss. Overall, the authors found that

high I-FoMO investors react more negatively to trading restrictions than low I-FoMO investors but are relatively less-affected by non-gains versus non-losses.

Overall, based on the prior studies reviewed, there exists a relationship between an individual's level of I-FoMO and their investment decision making. Furthermore, prior studies highlight the negative effects that I-FoMO could have on investor's judgment. As such, given that prior literature lacks an empirically validated method of mitigating I-FoMO, it is important to test whether SAB 121 acts as an effective mitigator and fulfils the SEC's objective of protecting investors.

3.3.2 Mitigating FoMO in an Investment Context

Although research in psychology has provided several methods and techniques to mitigate the effects of FoMO in a social context (e.g., Santos et al., 2016; Alutaybi et al., 2020), in the financial context, it has been regulators that have attempted to present guidance to mitigate the influence of FoMO on investors' investing decisions. Specifically, in 2021, the SEC published an investor alert and bulletin cautioning digital asset investors experiencing FoMO to "take the time to understand how the investment works and to evaluate its risks" prior to making digital asset investment decisions (SEC, 2021a). Similarly, in a subsequent investor alert published by the SEC in 2022, the SEC reinforced the previous advice given to investors experiencing FoMO by stating "If you are considering a crypto asset-related investment, take the time to understand how the investment works" (SEC, 2022c). To summarize the advice provided by the SEC, investors should ensure that they understand crypto-assets as an investment class and their associated risks prior to investing in this environment.

In addition, the Ontario Securities Commission (OSC), an independent crown corporation that is responsible for regulating the capital markets in Ontario, Canada, published an article identifying four tools to mitigate the effects of FoMO (OSC, 2021):

1. Ensure to understand how the asset class works, including its associated risks.
2. Ensure that the potential investment aligns with the investor's short and long-term financial goals.
3. Understand that, for most investors, building wealth is a long-term pursuit and happens rarely overnight. As such, investors should resist the temptation to panic at bad news or chase after the latest craze.
4. Investors should be aware of behavioural biases and how these can influence their investment decision making when experiencing FoMO. The two most common behavioural biases include:
    a. Confirmation bias – The tendency to look for information that supports our beliefs and affirms that our opinion is correct, and
    b. Overconfidence – The idea that people are overconfident in their investing abilities although investors recognize that most individuals cannot "beat the market" by trading frequently.

The solution proposed by the OSC for confirmation biases is to "Seek out information that contradicts what you think about a particular investment" while for overconfidence, investors should "Give themselves a reality check. Even professional investment advisers may struggle to achieve better-than-market returns."

3.4 Conclusion

To summarize, I reviewed psychology literature to provide an understanding of how FoMO is an example of non-rational human behaviour. In addition, I reviewed relevant psychology literature outlining methods of mitigating FoMO. The chapter then highlights how FoMO in a social context differs from FoMO in an investment context. I then reviewed relevant management studies pertaining to FoMO in an investment context and outline recommendations from financial regulators pertaining to mitigating FoMO. Given the lack of empirically validated techniques to counteract the effects of FoMO in an investing setting, this dissertation evaluates the extent to which FoMO exists in individuals trading in the unregulated crypto-asset space and the extent to which SAB 121 is an effective FoMO regulator by providing the requisite information.

Chapter 4 – Theory and Hypotheses

4.1 Overview

This chapter presents the development of the four hypotheses associated with the two experiments carried out in this dissertation. These hypotheses examine the extent to which FoMO occurs in crypto-asset investors and the influence of SAB 121 on investors' decision making. Hypothesis 1 and Hypothesis 2 pertain to the main effects of FoMO and SAB 121 respectively on investors propensity to invest in the crypto-asset environment. Hypothesis 3 is an interaction hypothesis predicting that SAB 121 would only affect higher FoMO (but not lower FoMO) investors' propensity to invest in the digital asset space. Finally, Hypothesis 4 is a conditional indirect hypothesis describing the mechanism by which SAB 121 attenuates the effect of FoMO on investors' propensity to invest by heightening an investor's risk perception.

This chapter is organized as follows. In Section 4.2, 4.3, 4.4, and 4.5, I develop Hypothesis 1, Hypothesis 2, Hypothesis 3, and Hypothesis 4 respectively. Section 4.6 provides the conclusions of the chapter.

4.2 The Influence of FoMO on Crypto-asset Investors

The relationship between FoMO and investors decision making is consistent with the underlying theoretical underpinning of FoMO which conceptualizes investment related FoMO as an individual's propensity to experience negative emotions (e.g., fear and anxiousness) associated with missing out on future financial gains (Clor-Proell et al., 2020). FoMO leads individuals to trade in risky investments with perceived upside potential to avoid the negative emotions associated with missing out on future financial

gains (Delfabbro et al., 2021a). Prior literature has established a relationship between FoMO with investing activities (Clor-Proell et al., 2020; Shiva et al., 2020; Gupta & Shrivastava, 2022; Argan et al., 2023; Potsaid & Venkataraman, 2022). More specifically, FoMO has been established as a key risk factor associated with excessive speculative crypto and stock trading (Delfabbro et al., 2021a).

The risky nature of the crypto-asset environment coupled with the potential for elevated future financial gains leads investors with higher levels of FoMO to experience more negative emotions (e.g., fear and anxiousness) pertaining to missing out on the possibility for future monetary gains as compared to low FoMO investors (Clor-Proell et al., 2020). In other words, this suggests that higher FoMO investors would have a higher propensity to invest in crypto-assets as compared to investors with lower levels of FoMO. This leads to the following formal hypothesis:

> **H_1:** Investors with higher levels of FoMO will have a higher propensity to invest in the crypto-asset environment as compared to investors with lower levels of FoMO.

4.3 The Dampening Effect of SAB 121 on Investors

SAB 121 focuses on the technological, legal, and regulatory risks associated with entities safeguarding clients' crypto-assets and maintaining the cryptographic key information necessary to access these assets. As part of the financial reporting requirements under SAB 121, corporations need to provide risk disclosures of the potential impact that the destruction, loss, theft, or compromise or unavailability of the cryptographic key information would have to the ongoing business, financial condition, operating results, and cash flows of the entity (SEC, 2022a). Given the inherent nature

of SAB 121, the regulation makes the risks associated with investing in the crypto-asset environment more salient thereby dampening investors' perceived upside potential.[14]

When evaluating a company for investment purposes, investors find negative information more relevant than positive information (Kahneman & Tversky, 1979; Weber, 1994). Coram (2010), for instance, found that negative information has a significant downward effect on stock price estimates provided by investors. By nature, risk disclosures emphasize the downside aspect of risk and can be characterized as having potentially negative consequences on future firm performance (Lajili & Zeghal, 2005). For instance, Fortin and Berthelot (2012) found that investors who receive a management discussion and analysis (MD&A) with risk disclosures will have more negative perceptions of a firm's future performance, and that the risk disclosure will have a negative effect on their investment decisions.

To summarize, SAB 121 requires companies to disclose information highlighting the technological, legal, and regulatory risks associated with entities safeguarding user's crypto-assets which provides negative information to investors. It follows that the required SAB 121 disclosures will increase investors' awareness of the riskiness of the crypto-asset environment and thereby dampen their propensity to invest in the crypto-asset environment. This leads to the following formal hypothesis:

> **H_2:** In the presence of SAB 121, investors will have a lower propensity to invest in the crypto-asset environment.

[14] This is consistent with the theoretical underpinning of priming which occurs when certain stimuli or event increases the availability of specific information thereby affecting information processing and, as a result, decision making (Baron & Byrne, 1997). In my setting, the prime (i.e., the item used to manipulate or increase knowledge activation) is SAB 121 and the outcome (i.e., what the prime is applied to in an effort to produce specific outcomes) is the investor's decision making (Higgins, Bargh, & Lombardi, 1985).

4.4 Interaction Hypothesis

Hypothesis 1 suggested that the risky nature of the crypto-asset environment coupled with the potential for elevated future financial gains would lead investors with higher levels of FoMO – as compared to investors with lower levels of FoMO - to experience more negative emotions (e.g., fear and anxiousness) pertaining to missing out on the possibility for future financial gains and thereby lead them to be more likely to invest in the crypto-asset environment. Hypothesis 2 suggested that exposure to SAB 121 will dampen investors propensity to invest in the crypto-asset environment. Prior research has found that investors with higher levels of FoMO react more negatively to trading restrictions relative to lower FoMO investors (Potsaid & Venkataraman, 2022). Given that trading restrictions and SAB 121 are both interpreted as negative news by investors, it is expected that investors' level of FoMO will affect how they respond to SAB 121. Thus, it follows that SAB 121 will affect investors with higher FoMO more than investors with lower FoMO. This leads to the following formal hypothesis:

> **H_3:** Investors with higher levels of FoMO will have a lower propensity to invest in the crypto-asset environment in the presence rather than absence of SAB 121 while no change will occur for investors with lower levels of FoMO.

Figure 1 graphically presents the predictions associated with Hypothesis 1, Hypothesis 2, and Hypothesis 3.

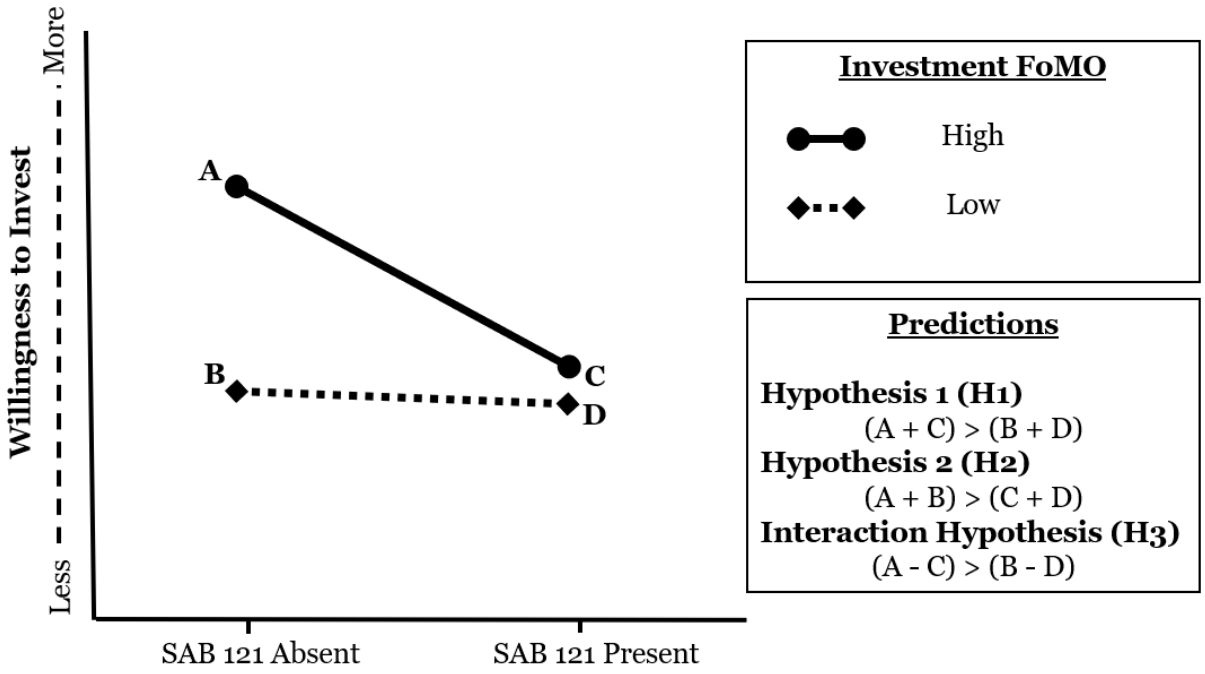


Figure 1: Illustration of predictions H_1, H_2, and H_3. H_1 predicts that investors with higher levels of FoMO will have a higher propensity to invest in the crypto-asset environment as compared to investors with lower levels of FoMO. H_2 predicts that in the presence of SAB 121, investors will have a lower propensity to invest in the crypto-asset environment. H_3 predicts that the effect predicted in H_2 will affect investors with higher levels of FoMO more than investors with lower levels of FoMO.

4.5 The Mediating Role of Risk Perception on Investors

The purpose of this section is to develop the final hypothesis (i.e., Hypothesis 4) to elucidate the mechanism by which SAB 121 influences high FoMO (but not low FoMO) investors propensity to invest in the crypto-asset environment.

Prior literature has shown that psychological factors influence investors' risk perception when making financial investment decisions (Chaitanya & Nordin, 2021). Negative psychological factors such as stress have been found to increase biases and lead to lower-level processing thereby leading individuals to take riskier choices (Porcelli & Delgado, 2009). On the other hand, positive psychological factors such as positive mood have been found to help individuals properly assess risk and return criteria (Sushmita, Brijeh, Aneesya & Avnish, 2020). As such, negative psychological

factors appear to increase risk taking behaviour whereas positive psychological factors appear to decrease risk taking behaviour.

Given that the fear of missing out is a psychological factor that invokes negative emotions (e.g., fear, anxiousness, worry) associated with missing out on future financial gains (Clor-Proell et al., 2020), higher FoMO investors' perception of risk would depend on whether they are exposed to SAB 121. When SAB 121 is presented to investors, their perception of risk would increase given the fact that the regulation makes the risks associated with investing in the crypto-asset environment more salient. On the other hand, when SAB 121 is absent (i.e., not presented) to investors, the negative emotions associated with missing out on a potential favourable future financial gain would be highest thereby leading to a lower perception of risk. Given that high FoMO individuals' reluctancy to invest in the crypto-asset environment depends on the presence/absence of SAB 121 (see hypothesis 3), the mediating role that risk perception has between the presence/absence of SAB 121 and investors' propensity to invest in the crypto-asset environment would only be applicable to higher FoMO investors. This leads to the following formal hypothesis that describes the conditional indirect effect of SAB 121 on investors' propensity to invest through risk perception for higher FoMO investors:

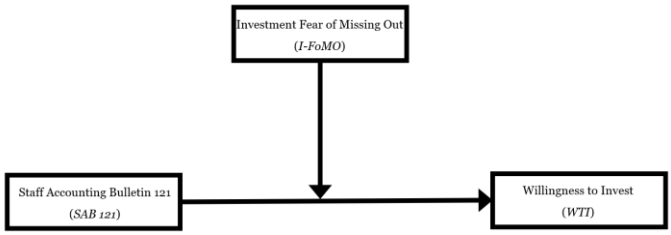
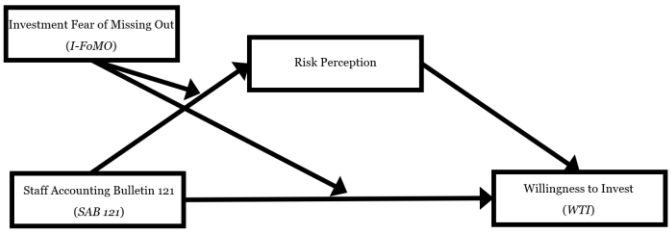
> **H4:** There is a conditional indirect effect of SAB 121 on investors' propensity to invest through risk perception such that for investors with higher levels of FoMO, risk perception will mediate the negative relationship between SAB 121 and investors' propensity to invest whereas for investors with lower levels of FoMO no indirect effect will be present.

4.6 Conclusion

This dissertation presents four hypotheses: Hypothesis 1 and Hypothesis 2 pertain to the direct effects of FoMO and SAB 121 respectively on investors propensity to invest. Hypothesis 3 is an interaction hypothesis predicting that SAB 121 would only affect investors with higher levels of FoMO. Finally, Hypothesis 4 is a conditional indirect hypothesis describing the mediating mechanism by which SAB 121 attenuates the effect of FoMO on investors' willingness to invest through risk perception. In Experiment 1, I test the first three hypotheses while in Experiment 2, I test Hypothesis 4.

Chapter 5 –Methodology

I employ two randomized experiments to test the effects of SAB 121 and FoMO on investors' investment decision making. While I acknowledge that performing a single experiment to test the proposed hypotheses is possible, I conducted two experiments using different samples for multiple reasons. Firstly, identifying significant treatment effects across multiple studies increases the robustness of the results (Grégoire, Binder, & Rauch 2019; Patel & Fiet, 2010). This is a vital advantage of a multiple study design as compared to a single study (Diener, 1998; Ledgerwood & Sherman, 2012). Secondly, carrying out multiple experiments enables the researcher to simplify the experimental design thereby conserving statistical power and removing the need for complex multiway interactions (Box & Meyer, 1986). Table 2 provides a summary of the experiments conducted in this dissertation along with the empirical models tested.

Experiment	Empirical Models	Hypotheses Tested
Experiment 1		Testing the main effects of I-FoMO (H_1) and SAB 121 (H_2) and the interaction of I-FoMO and SAB 121 (H_3).
Experiment 2		Testing the conditional indirect effect by which SAB 121 attenuates the effect of I-FoMO on investors' willingness to invest through risk perception (H_4). In addition, replicating

		the results observed in Experiment 1.

Table 2: Overview of the models tested.

The remainder of this chapter is organized as follows. In Section 5.1, I describe the details of the experimental design for Experiment 1. In Section 5.2, I discuss the methodology for Experiment 2.

5.1 Experiment 1

Experiment 1 seeks to test whether investors with higher levels of FoMO have a higher propensity to invest in the crypto-asset environment (Hypothesis 1), whether exposure to SAB 121 decreases investors' propensity to invest in the crypto-asset environment (Hypothesis 2), and whether SAB 121 decreases investors' propensity to invest in the crypto-asset space for high (but not low) levels of FoMO (Hypothesis 3). The experiment was performed online and contained two experimental conditions. Participants were first presented with the historical stock price action of a crypto-asset platform and were then randomly assigned to either a treatment or a control condition. In the treatment condition, subjects were presented with a disclosure consistent with SAB 121 while in the control condition the disclosure was absent. My dependent variable was operationalized as participants' willingness to invest. The level of an investor's FoMO was measured following the participant's reporting of the dependent variables.

5.1.1 Sample Size Planning

To estimate the number of participants needed, I used G*Power, a valid and reliable statistical analysis software used in the social and behavioural sciences (Faul et al., 2007). Based on prior I-FoMO research (Clor-Proell et al., 2020; Potsaid & Venkataraman, 2022) and to be conservative, I chose a small-to-medium effect size of

0.12 based on Cohen's f^2. Cohen's f^2 is an effect size statistic frequently used in multiple regression models (Cohen, 1988) and is given by the following equation:

$$f^2 = \frac{R^2}{1 - R^2}$$

Where R^2 denotes the proportion of the variance for a dependent variable that is explained by the independent variables in the regression model. According to Cohen's (1988) guidelines, $f^2 \geq 0.02$, $f^2 \geq 0.15$, and $f^2 \geq 0.35$ represent small, medium, and large effect sizes, respectively.

The required sample size to achieve 80% statistical power with a type I error rate of 5% was 95. Considering that I would need to retain a sufficiently large sample of observations after excluding participants who failed the manipulation and/or the attention checks, I aimed to recruit 100 participants. Figure 2 illustrates the sample size calculation through G*Power.

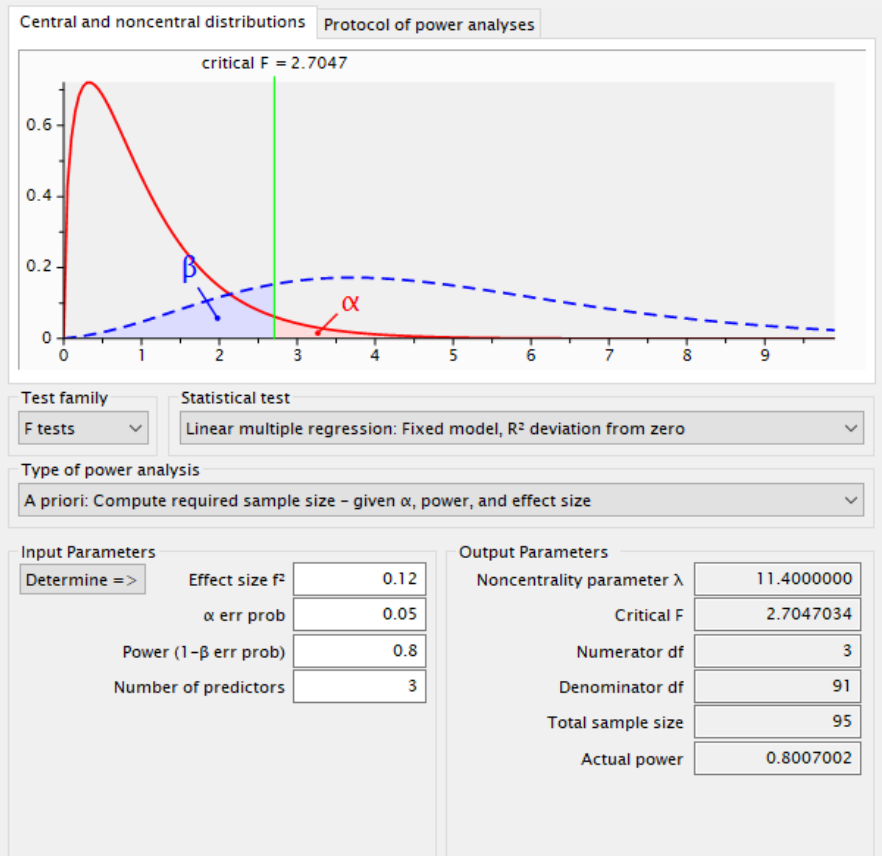


Figure 2: Sample size calculation on G*Power for Experiment 1.

5.1.2 Participants

To target the population of interest, I recruited participants through Prolific Academic (Prolific), an online crowdsourcing platform. Similar to Amazon's Mechanical Turk (MTurk) and Qualtrics, Prolific enables researchers to access a large pool of participants. Prolific is designed specifically for academic research and has the advantage of including a variety of pre-screening options that enable researchers to select qualified participants. In addition, relative to other crowdsourcing platforms, Prolific's participants tend to be more honest and produce higher quality data (Peer et al., 2017). For economics and social science experiments, Prolific has been considered as a superior option as compared to other platforms (Palan & Schitter, 2018) and has been used to recruit participants for several accounting studies (e.g., Murphy et al., 2019;

Barcellos & Kadous, 2022). Using Prolific's pre-screening functionality, I limited participants to those that were fluent in the English language, had prior experience investing in the stock market and crypto-asset market and possessed experience examining a company's financial statements (for example, through its annual report or SEC filings) as part of their common stock investment evaluation. I excluded participants who failed the comprehension check and/or attention check. The final sample size was 95. Once participants were recruited, they were re-directed through a web-link to the Qualtrics survey containing the experimental material. Each participant that completed the experiment was paid through Prolific.[15]

5.1.3 Experimental Task

Participants in the experimental task took on the role of a potential investor in a fictitious cryptocurrency exchange called Crypto Inc. As participants progressed through the experiment, time advanced to simulate a stock-market trading day (9:30 AM – 4:00 PM). A clock on each page provided the time so that participants were aware of how much more time was available to make trades. Participants were primed to receive periodic stock price updates as they were told that they had signed up for price alerts for Crypto Inc.

The experiment begins at 9:30 AM when participants are provided background information on Crypto Inc including its current stock price ($80). At 11:00 AM participants view a tweet from an influential investor who indicates that they believe that Crypto Inc's stock is undervalued and is expected to increase significantly in the

[15] Participants were paid £2.25 for agreeing to participate in the experiment which is consistent with other Prolific surveys. The experiment took participants, on average, 9 minutes to complete.

short term. Concurrently, participants are informed that Crypto Inc's stock price has increased to $90. At 1:00 PM participants are given an update on Crypto Inc's stock and are told that the current price is $100. At 4:00 PM, participants are told that the stock market has closed, and that Crypto Inc' stock closed at $130 (i.e., $30 higher than when the market opened). At this point, participants are randomly assigned to a treatment or control condition. In the treatment condition, subjects are presented with a disclosure consistent with SAB 121 while in the control condition, the disclosure is not presented to subjects.

After reviewing the experimental material provided pertaining to Crypto Inc, participants were asked to respond to the three primary dependent variables. Following these questions, participants were asked to address three questions pertaining to process measures followed by a comprehension check and an attention check. Lastly, participants completed the validated FoMO and I-FoMO scales. The experiment concluded with subjects addressing a series of demographic questions. Figure 3 summarizes the experimental design flow and Appendix B provides all information provided to the participants during the experiment.

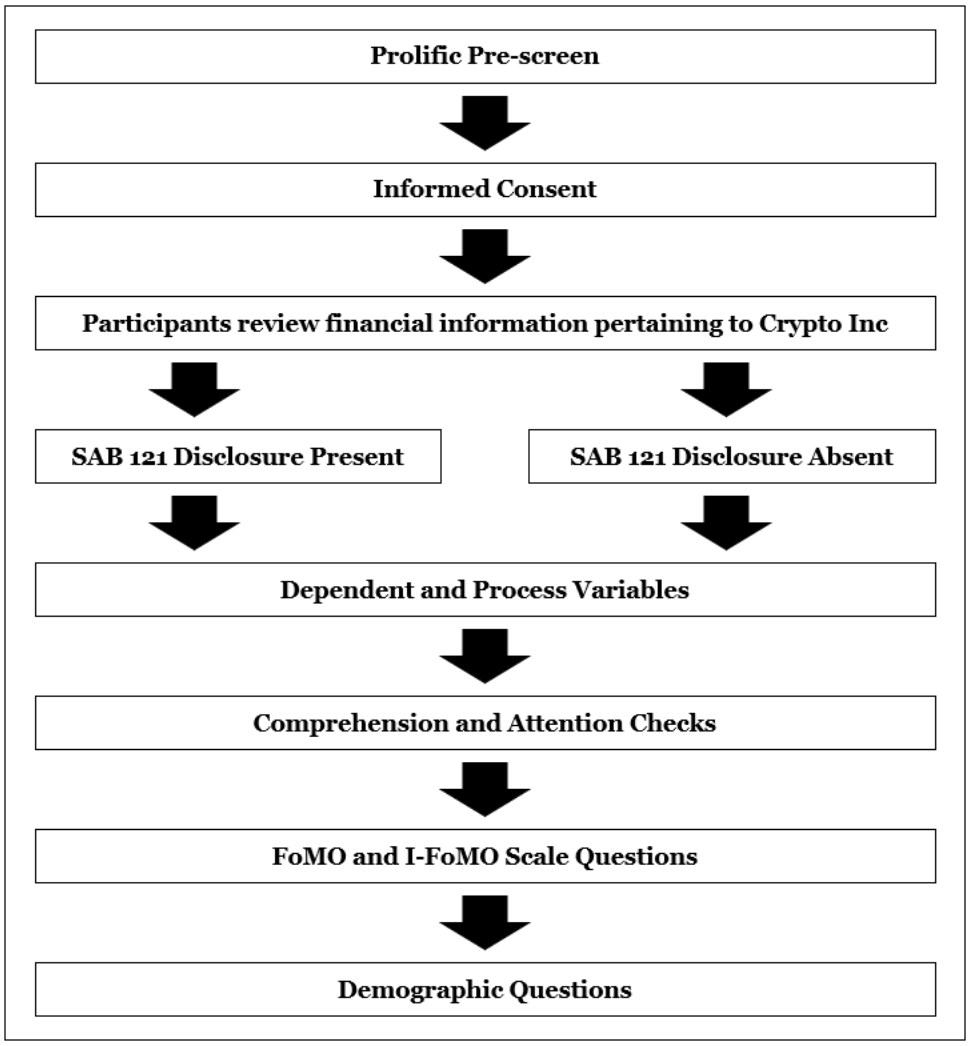


Figure 3: Experimental Flow for Experiment 1.

5.1.4 Independent Variables

I used two independent variables – one of which was measured and the other manipulated – in the experimental design.

5.1.4.1 Investment Fear of Missing Out (I-FoMO)

I measured participants' fear of missing out on investment information (I-FoMO) using a 10-item scale documented and validated by Clor-Proell et al. (2020) with endpoints 1 ("Not at all true of me") and 5 ("Extremely true of me"). Given the quantitative nature of the measure, *I-FoMO* is a continuous (interval scale) variable and

was utilized accordingly in the regression models. The scale had been previously used in several highly cited published research studies (e.g., Clor-Proell et al., 2020; Potsaid & Venkataraman, 2022).

5.1.4.2 Staff Accounting Bulletin No. 121 (SAB 121)

I manipulate SAB 121 at two levels: treatment (i.e., presence of SAB 121 disclosure) and control (i.e., absence of SAB 121 disclosure). In the treatment condition, after reading the financial information pertaining to Crypto Inc, participants were presented with the Crypto Inc update displayed in Figure 4 prior to proceeding to addressing the dependent variable questions.

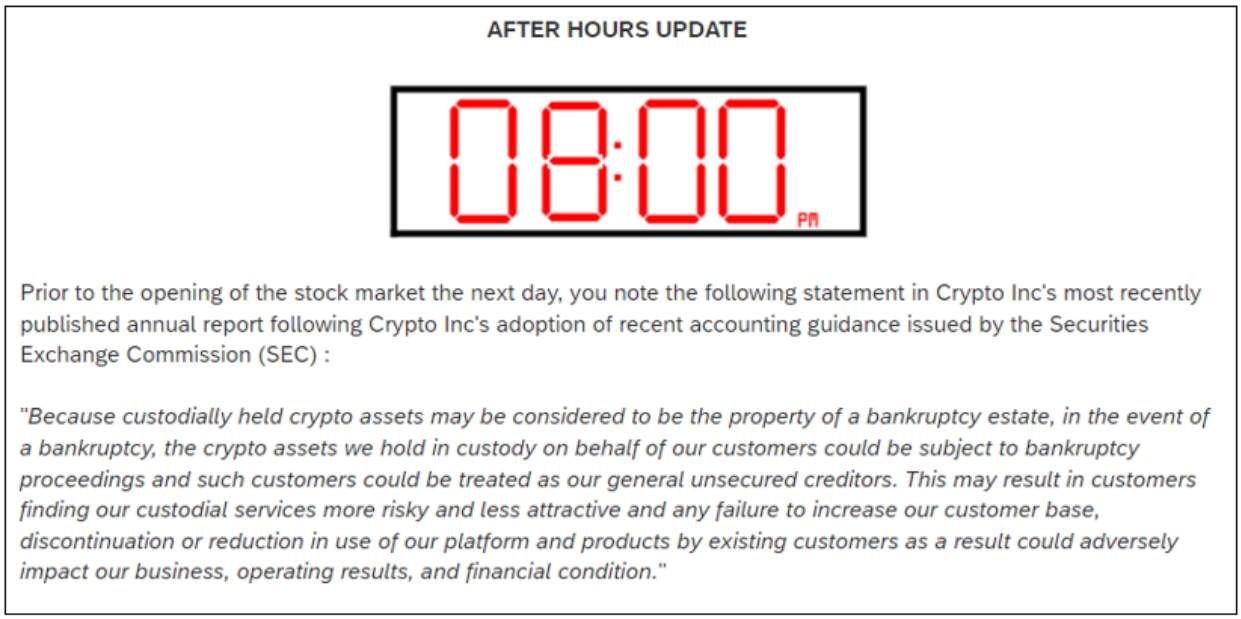


Figure 4: SAB 121 Manipulation.

In the control condition, after reading the financial information pertaining to Crypto Inc, participants were *not* presented with the Crypto Inc update displayed in Figure 4 and instead proceeded directly to addressing the dependent variable questions.

The SAB 121 disclosure appearing on Figure 4 is grounded on Coinbase Global Inc.'s Form 10-Q for the quarterly period ended March 31, 2022. Form 10-Q includes unaudited financial statements and provides a continuing view of the company's financial position during the year. Form 10-Q must be filed with the SEC for each of the first three fiscal quarters of the company's fiscal year.

Given the dichotomous nature of SAB 121, the variable was binary coded in the regression models such that in the treatment condition *SAB121* equals 1 and in the control condition *SAB121* equals 0.

5.1.5 Dependent Variables

I assessed participants' willingness to invest in the fictitious crypto-asset platform by collecting responses to three scaled questions commonly used in previous research (Asay, Hales, Hinds, & Rupar, 2021; Barcellos & Kadous, 2022). These questions were: "How attractive is an investment in Crypto Inc?" with endpoints 0 ("Extremely unattractive") and 100 ("Extremely attractive"); "How likely are you to invest in Crypto Inc?" with endpoints 0 ("Extremely unlikely") and 100 ("Extremely likely"); and "Assume you have $10,000 USD to invest. How much of these funds will you invest in Crypto Inc?" with endpoints $0 ("Nothing at all") and $10,000 ("Entire amount"). I rescaled the third question such that all are three questions are on the same 101-point scale.

A principal component analysis revealed that the three measures load in the expected direction onto one component, which explains 80.4 percent of the variance and has an eigenvalue of 2.41. I measure my main dependent variable, *Willingness to Invest* (*WTI*), by averaging a participant's response to the three questions. Having said

this, robustness checks suggest that inferences are unchanged if I use responses to each of the questions individually. The approach that I followed to combine the three measures into a single construct is consistent with that performed by Barcellos & Kadous (2022).

5.1.6 Process Measures

I measured a participant's perceived risk of investing in Crypto Inc using an adaptation of Faqih (2016)'s three-item perceived risk scale. I asked participants to report their level of agreement with each of the three statements: "Investing in Crypto Inc is risky"; "There is too much uncertainty associated with investing in Crypto Inc"; "Compared with other investments, Crypto Inc's stock is riskier." All three statements had endpoints of 0 ("Strongly disagree") and 100 ("Strongly agree').

5.1.7 Attention and Manipulation Checks

A significant problem exists in accounting research regarding the lack of consistent and accurate terminology as it pertains to attention checks and manipulation checks (Rose, 2017). Attention checks are used to demonstrate that experimental subjects have read and attended to the experimental treatment while manipulation checks are used to measure the effects of treatments on theoretical constructs (Rose, 2017).

In my experiment, SAB 121 is manipulated according to whether the disclosure is presented to participants or not. Given that the manipulation is not examining an underlying psychological construct but is instead focusing on a practical relationship between a treatment condition that mimics real-world relationships and decisions made by investors (Rose, 2017), I used an attention check. The attention check asked

participants to address the following question: “In the event of a bankruptcy, how does Crypto Inc treat crypto assets held in custody?”. Participants were then presented with the following two options: “The crypto assets held in custody on behalf of customers could be subject to bankruptcy proceedings and such customers could be treated as general unsecured creditors” and “No information regarding the treatment of crypto assets held in custody was presented”. Participants who failed the attention check were removed from the data prior to the statistical analysis to increase statistical power via noise reduction (Rose, 2017).

I also used an Instructional Manipulation Check (IMC)[16] to further increase statistical power and the reliability of the final dataset (Oppenheimer, Meyvis, & Davidenko, 2009). The IMC presented, asked participants to answer the following question: “To show that you are paying attention, please select "none of the above" option as your answer” while providing participants with the following five multiple choice options “Strong”, “Indifferent”, “Weak”, “Hostile”, and “None of the above”. Participants who failed the IMC were removed from the data prior to the statistical analysis to increase statistical power.

5.1.8 Covariates and Demographics

To test the possible effects of other determinants of participants’ investment decision, I collected demographic information. While I expect that the effect of demographic variables should be reasonably controlled through random assignment of participants to the various conditions, factors that correlate with I-FoMO, such as age

[16] An Instructional Manipulation Check (IMC) consists of a question embedded within the experimental material that is similar to other questions in lengths and response format and provides a confirmation that participants have read the instruction (Oppenheimer et al., 2009).

and work experience may differ according to the level of I-FoMO (Clor-Proell et al., 2020). In addition to age and work experience, participants were asked to provide information regarding their education, work experience, and investing experience given that prior studies have suggested that these factors play a pivotal role in both investment decisions and I-FoMO (Shiva et al., 2020).

5.1.9 Development and Validation of Experimental Material

The experimental material used was adapted from Potsaid & Venkataraman (2022). Although the format of the case provided to participants resembles Potsaid & Venkataraman (2022)'s instrument, the name of the fictitious company and the information pertaining to the company varies. In addition, the dependent variables and attention checks were adapted for the purposes of this study. Lastly, the I-FoMO scale employed in the experiment has been previously validated by Clor-Proell et al. (2020) and was used by Potsaid & Venkataraman (2022) in their experiment.

To refine the experimental materials for clarity and effectiveness, I obtained detailed feedback from the following individuals: two accounting doctoral candidates, an MBA candidate, a recent Bachelor of Commerce graduate, a psychology professor, and three management scholars. Based on their feedback, I revised the experimental material accordingly.

5.2 Experiment 2

The objective of Experiment 2 was to test H_4 with the goal of testing the conditional indirect effect by which SAB 121 attenuates the effect of FoMO on investors'

willingness to invest through risk perception.[17] Generally, the experimental procedures mirror the design discussed for Experiment 1; however, the sample size is larger to capture the conditional mediation effect.

5.2.1 Sample Size Planning

To estimate the number of participants needed, I used G*Power, a valid and reliable statistical analysis software used in the social and behavioural sciences (Faul et al., 2007). In the experiment 1, I used a small-to-medium effect size of 0.12 based on Cohen's f^2 given prior I-FoMO research (Clor-Proell et al., 2020; Potsaid & Venkataraman, 2022) and to be conservative. However, for Experiment 2, I chose a small effect size of 0.03 based on Cohen's f^2 given that the complexity of the theoretical model that I test in Experiment 2 is higher than for Experiment 1.

The required sample size to achieve 80% statistical power with a type I error rate of 5% was 403. Considering that I would need to retain a sufficiently large sample of observations after excluding participants who failed the manipulation and/or the attention checks, I aimed to recruit 450 participants. Figure 5 illustrates the sample size calculation through G*Power.

[17] Another objective of Experiment 2 was to replicate the results of Experiment 1 to increase the reliability and robustness of the results obtained in Experiment 1.

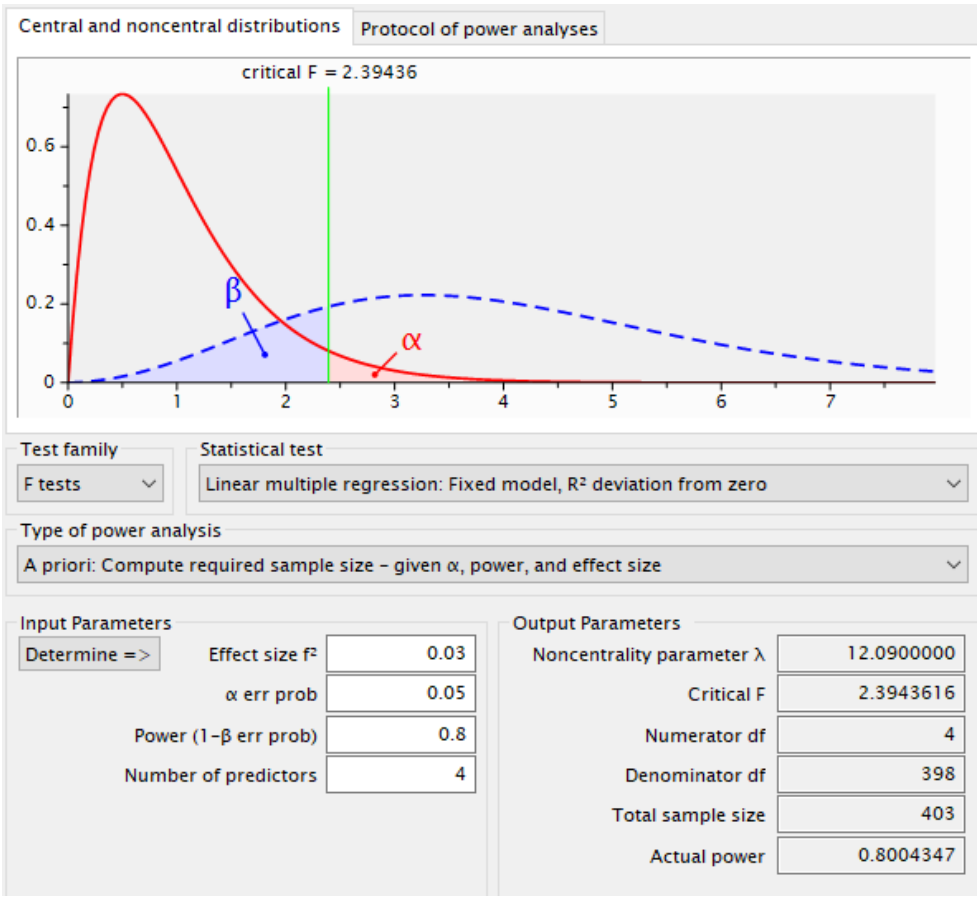


Figure 5: Sample size calculation on G*Power for Experiment 2.

5.2.2 Pre-registration

Concerns about the replicability of research findings in many disciplines have been raised in the recent past (e.g., Camerer et al., 2016; Simmons et al., 2020). These concerns have led the scientific community to emphasize the importance of carrying out replication studies to assert whether the original findings can be relied upon (Brandt et al., 2014; Camerer et al., 2018). Some scholars have voiced concerns that the 'credibility crisis' is due to a behaviour known as p-hacking [18] (Simonsohn, Nelson, & Simmons, 2014), which "makes it easy for morally good researchers to produce false findings that are statistically significant." (Simmons et al., 2020, p. 153). P-hacking can enable a

[18] P-hacking occurs when researchers "try out several statistical analyses and/or data eligibility specifications and then selectively report those that produce significant results" (Head, Holman, Lanfear, Kahn, & Jennions, 2015).

researcher to repeatedly find statistically significant results to support any hypothesis (Simmons et al., 2020). Given that researchers are more likely to publish significant than non-significant results (e.g., Rosenthal, 1979), p-hacking can make it possible for whole literatures to be false (Simmons et al., 2020). A proposed remedy for p-hacking is to pre-register studies thereby decreasing the likelihood that the study reports false positive results (Moore, 2016).

Pre-registration is the act of documenting the study plan prior to any data being collected (Moore, 2016; Nosek, Ebersole, DeHaven, & Mellor, 2018; van't Veer & Giner-Sorolla, 2016). The process normally involves outlining, in a time-stamped document, various details pertaining to the research plan including: (1) the research question or hypotheses, (2) the independent and dependent variables including relevant controls, (3) a rationale of how the sample size will be determined, (4) the rationale for deciding which observation will be removed prior to commencing data analysis, and (5) the precise specification of the key analysis (Simmons et al., 2020). Although best practices dictate that pre-registration should take place prior to data collection, researchers who are in the process of collecting data may still consider pre-registering their research plan (Lindsay, Simons, & Lilienfeld, 2016). If the researchers decide to pre-register their study during the data collection phase, additional explanations will need to be provided to readers to justify why the pre-registration is still valid. However, once data collection has been completed, researchers are no longer able to pre-register their study.

Even though the process of pre-registration requires researchers to outline, in a meticulous manner, their research plan to resolve issues of false positives caused by p-hacking (Simmons et al., 2020), the researcher may find that deviations from the

original pre-registered plan are inevitable. In these cases, the researcher should outline and explain the deviations from the pre-registered plan in the manuscript (DeHaven, 2017). The pre-registration process does not prohibit researchers from exploring the data and sharing exploratory findings as long as the researchers are transparent and acknowledge that the discovery is exploratory in nature (Simmons et al., 2020).

In an effort to follow best research practices, I used the AsPredicted platform to pre-register my research study plans prior to the commencement of data collection for Experiment 2. AsPredicted is part of The Penn Wharton Credibility Lab initiative to strengthen the credibility of research (The Wharton School, 2021). To pre-register a project on AsPredicted, a researcher answers nine questions pertaining to the planned research design and analyses. The platform then generates a short, time-stamped pre-registration document. My time-stamped pre-registered form for Experiment 2 can be accessed at: https://aspredicted.org/blind.php?x=7JM_9LQ. To be transparent, I disclose that Experiment 1 was not pre-registered as I was only aware of the practice of pre-registration after completing the data collection for Experiment 1. I report all the findings, both statistically significant and null findings for the pre-registered hypotheses and models.

5.2.3 Participants

To target the population of interest, I recruited participants from Prolific Academic (Prolific). Using Prolific's pre-screening functionality, I limited participants to those that had not participated in Experiment 1, were fluent in the English language, had prior experience investing in the stock market and crypto-asset market and possessed experience examining a company's financial statements (for example, through

its annual report or SEC filings) as part of their common stock investment evaluation. I excluded participants who failed the comprehension check and/or attention check. The final sample was 412. Once participants were recruited, they were re-directed through a web-link to the Qualtrics survey containing the experimental material. Each participant that completed the experiment was paid through Prolific.[19]

5.2.4 Experimental Task

The experimental task that participants were presented with was the same as that outlined in Experiment 1. Participants in the experimental task took on the role of a potential investor in a fictitious cryptocurrency exchange called Crypto Inc. As participants progressed through the experiment, time advanced to simulate a stock-market trading day (9:30 AM – 4:00 PM). A clock on each page provided the time so that participants were aware of how much more time was available to make trades. Participants were primed to receive periodic stock price updates as they were told that they had signed up for price alerts for Crypto Inc.

The experiment begins at 9:30 AM when participants are provided background information on Crypto Inc including its current stock price ($80). At 11:00 AM participants view a tweet from an influential investor who indicates that they believe that Crypto Inc's stock is undervalued and is expected to increase significantly in the short term. Concurrently, participants are informed that Crypto Inc's stock price has increased to $90. At 1:00 PM participants are given an update on Crypto Inc's stock and are told that the current price is $100. At 4:00 PM, participants are told that the stock

[19] Participants were paid £1.5 for agreeing to participate in the experiment which is consistent with other Prolific surveys. The experiment took participants, on average, 8.5 minutes to complete.

market has closed, and that Crypto Inc' stock closed at $130 (i.e., $30 higher than when the market opened). At this point, participants are randomly assigned to a treatment or control condition. In the treatment condition, subjects are presented with a disclosure consistent with SAB 121 while in the control condition, the disclosure is not presented to subjects.

After reviewing the experimental material provided pertaining to Crypto Inc, participants were asked to respond to the three primary dependent variables. Following these questions, participants were asked to address three questions pertaining to process measures followed by a comprehension check and an attention check. Lastly, participants completed the validated FoMO and I-FoMO scales. The experiment concluded with subjects addressing a series of demographic questions. Figure 6 summarizes the experimental design flow and Appendix B provides all information provided to the participants during the experiment.

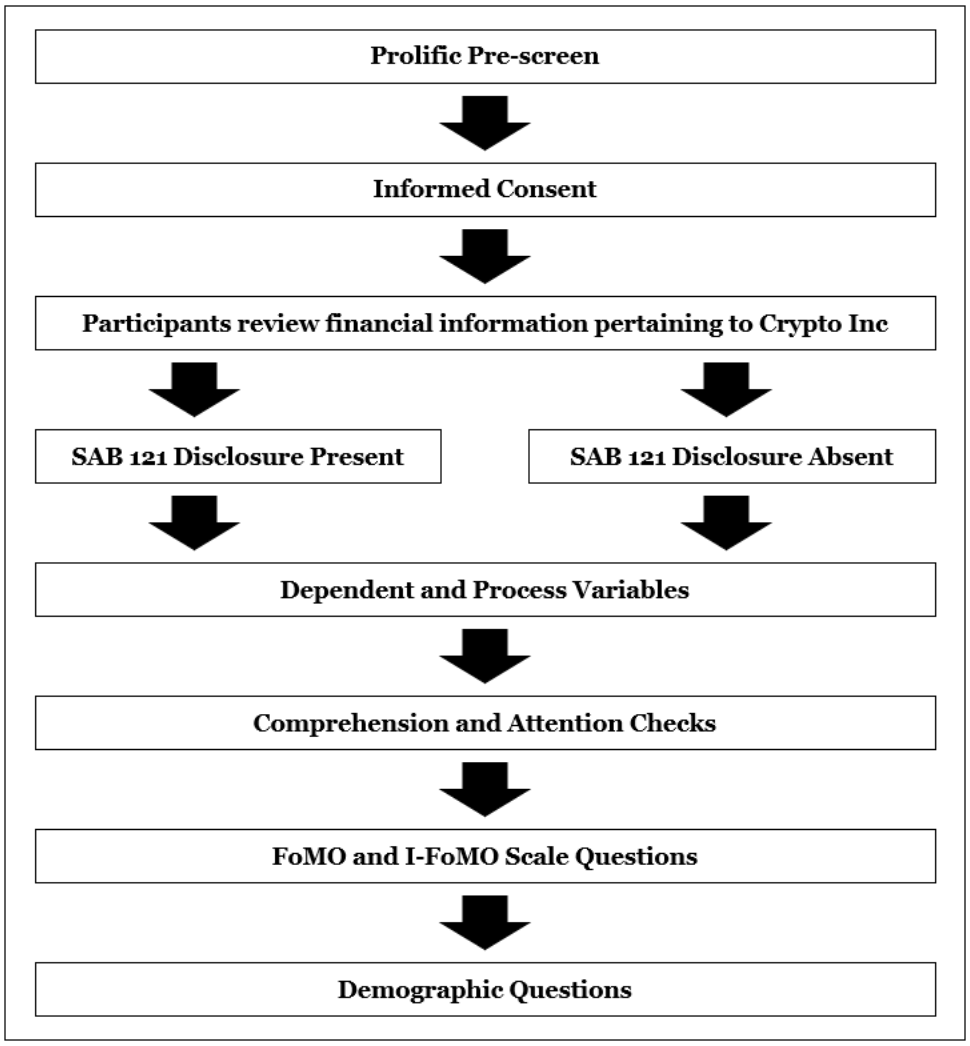


Figure 6: Experimental Flow for Experiment 2 (Same as Experiment 1).

5.2.5 Independent Variables

I used the same two independent variables presented in Experiment 1. Namely, I-FoMO which was measured according to the 10-item scale documented and validated by Clor-Proell et al. (2020) while SAB 121 was manipulated in the experimental design.

5.2.6 Dependent Variables

I assessed participants' willingness to invest in the fictitious crypto-asset platform by collecting responses to three scaled questions commonly used in previous research (Asay et al., 2021; Barcellos & Kadous, 2022). These questions were: "How

attractive is an investment in Crypto Inc?" with endpoints 0 ("Extremely unattractive") and 100 ("Extremely attractive"); "How likely are you to invest in Crypto Inc?" with endpoints 0 ("Extremely unlikely") and 100 ("Extremely likely"); and "Assume you have $10,000 USD to invest. How much of these funds will you invest in Crypto Inc?" with endpoints $0 ("Nothing at all") and $10,000 ("Entire amount"). I rescaled the third question such that all are three questions are on the same 101-point scale.

A principal component analysis revealed that the three measures load in the expected direction onto one component, which explains 83.8 percent of the variance and has an eigenvalue of 2.51. I measure my main dependent variable, *Willingness to Invest* (*WTI*), by averaging a participant's response to the three questions. The approach that I followed to combine the three measures into a single construct is consistent with that performed by Barcellos & Kadous (2022).

5.2.7 Process Measures

I measured a participant's perceived risk of investing in Crypto Inc using Faqih (2016)'s three-item perceived risk scale. I asked participants to report their level of agreement with each of the three statements: "Investing in Crypto Inc is risky"; "There is too much uncertainty associated with investing in Crypto Inc"; "Compared with other investments, Crypto Inc's stock is riskier." All three statements had endpoints of 0 ("Strongly disagree") and 100 ("Strongly agree').

5.2.8 Attention and Manipulation Checks

I used the same attention check and Instructional Manipulation Check (IMC) described in Experiment 1. Namely, the attention check asked participants to address the following question: "In the event of a bankruptcy, how does Crypto Inc treat crypto

assets held in custody?". Participants were then presented with the following two options: "The crypto assets held in custody on behalf of customers could be subject to bankruptcy proceedings and such customers could be treated as general unsecured creditors" and "No information regarding the treatment of crypto assets held in custody was presented". Participants who failed the attention check were removed from the data prior to the statistical analysis to increase statistical power via noise reduction (Rose, 2017). The IMC presented, asked participants to answer the following question: "To show that you are paying attention, please select "none of the above" option as your answer" while providing participants with the following five multiple choice options "Strong", "Indifferent", "Weak", "Hostile", and "None of the above". Participants who failed the IMC were removed from the data prior to the statistical analysis to increase statistical power.

5.2.9 Covariates and Demographics

Consistent with Experiment 1, I collected demographic information. These included factors that correlate with I-FoMO, such as age and work experience (Clor-Proell et al., 2020). In addition to age and work experience, participants were asked to provide information regarding their education, work experience, and investing experience given that prior studies have suggested that these factors play a pivotal role in both investment decisions and I-FoMO (Shiva et al., 2020).

Chapter 6 – Results

As noted in Chapter 5, Experiment 1 tests the first three hypotheses proposed in Chapter 4 and Experiment 2 tests Hypothesis 4. [20] Therefore, Experiment 1 and Experiment 2 were not carried out simultaneously, but instead in a successive manner, with Experiment 2 building and strengthening the results of Experiment 1.

This chapter is organized as follows. In Section 6.1, I present the results of Experiment 1. In Section 6.2, I present the results of Experiment 2.

6.1 Experiment 1

6.1.1 Participants

A total of 100 participants completed the experiment. As discussed in Section 5.1.7, I excluded participants who failed the attention check and/or the instructional comprehension check. As such, the final sample size was reduced to 95 subjects. Table 3 provides a summary of participant demographics. Participants varied between the ages of 19 and 69 with a mean age of 30.1 (*SD* = 9.6) and 81% were male. In terms of formal education, 67% of participants reported to have obtained either a 4-year degree, professional degree, or doctorate but more than 87% of participants reported to have taken less than 4 courses in accounting and finance at the college level. Over 51% of the participants had at least 5 years of work experience and over 41% had at least 5 years of investing experience.

[20] In Experiment 2, I also replicate the results found in Experiment 1 to increase the robustness of the findings.

	Range	Number	Percentage	Cumulative Percentage
Education:	Less than high school	0	0%	0%
	High school graduate	6	6%	6%
	Some college	14	15%	21%
	2-year degree	11	12%	33%
	4-year degree	40	42%	75%
	Professional degree	22	23%	98%
	Doctorate	2	2%	100%
Work Experience:	None	7	7%	7%
	1 - 4	39	41%	48%
	5 - 8	21	22%	71%
	9 - 12	8	8%	79%
	12+	20	21%	100%
Investing Experience:	0 - 1	10	11%	11%
	2 - 4	46	48%	59%
	5 - 7	18	19%	78%
	7 - 9	9	9%	87%
	10+	12	13%	100%
College Level Accounting Courses:	None	40	42%	42%
	1 - 4	44	46%	88%
	5 - 8	6	6%	95%
	9 - 12	3	3%	98%
	12+	2	2%	100%
College Level Finance Courses:	None	41	43%	43%
	1 - 4	42	44%	87%
	5 - 8	6	6%	94%
	9 - 12	2	2%	96%
	12+	4	4%	100%
Gender:	Male	77	81%	81%
	Female	17	18%	99%
	Non-binary / third gender	1	1%	100%
Age:	30.1			

Table 3: Participant Demographics [n = 95] by Range, Number, Percentage, and Cumulative Percentage.

6.1.2 Outlier Analysis

Outliers have been defined as anomalous observations with values that are inconsistent with the distribution of other observations in the data set (Mazzocchi, 2008). I assessed the data set for outliers based on three commonly used measures,

namely leverage[21], Mahalanobis Distance[22] and Cook's Distance[23]. Given that each statistic defines an observation as an outlier differently, to be conservative, I classified an outlier as a data point that is flagged as an outlier under at least two of the three measures. I did not find any observations meeting this requirement and, as such, I concluded that outliers were not present in the data set.

6.1.3 Testing for Basic Regression Assumptions

Prior to conducting the statistical analysis, I performed procedures to ensure that the data set met the basic assumptions of statistical analysis (LaMothe & Bobek, 2017). These assumptions include normality, heteroscedasticity, linearity, and independence.

I created a normal probability plot (i.e., a P-P plot) by graphing the cumulative probability of *Willingness to Invest* (i.e., the dependent variable) against the cumulative probability of a normal distribution. The plot ranks and sorts observations and then assigns a z-score corresponding to the rank of each observation. The z-score is then plotted against a standardized z-score of the observed values. As observed by the P-P plot in Figure 7, deviations from normality do not appear to be present given that the normal probability plot graphs a straight diagonal line of observations.

[21] Data points with high leverage have unusual x-values but do not necessarily affect regression coefficients. The threshold of whether an observation is considered an outlier is $\frac{2(K)+2}{N}$ where K is the number of independent variables and N is the total sample size. Observations with leverage values above the threshold are classified as outliers.

[22] Mahalanobis Distance is a measure to classify multivariate outliers which computes the multivariate distance of an observation from the mean center of all observations (Mahalanobis, 1936). Mahalanobis Distance follows a chi-square distribution. Observations that are three standard deviations or greater from the centroid are classified as outliers.

[23] Cook's Distance is a measure of influence and estimates the variation in regression coefficients after removing each observation, one by one (Cook, 1977). The threshold of whether an observation is considered an outlier is $\frac{4}{N-K-1}$ where K is the number of independent variables and N is the total sample size. Observations with Cook Distance values above the threshold are classified as outliers.

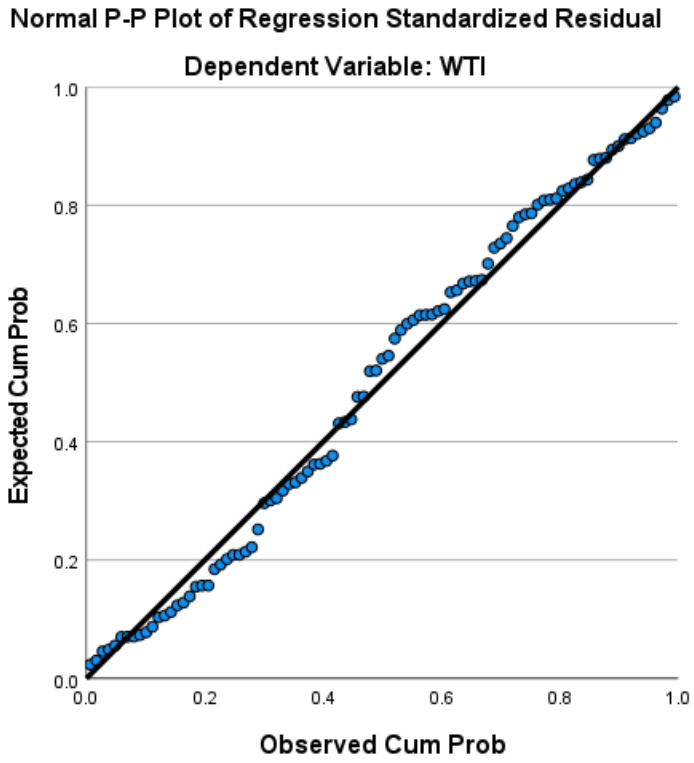


Figure 7: Normal probability plot (P-P Plot) of Willingness to Invest.

I created a scatterplot of regression standardized residuals versus regression standardized predicted values for *Willingness to Invest* to check for the heteroscedasticity assumption. Heteroscedasticity occurs when the variation in a dependent variable is non-constant across different levels of a predictor variable or groups (Hair, Black, Babin, & Anderson, 2010). I note that the data set does not violate the heteroscedasticity assumption given that the scatterplot on Figure 6 is not characterized by a specific shape such as a cone or a diamond.

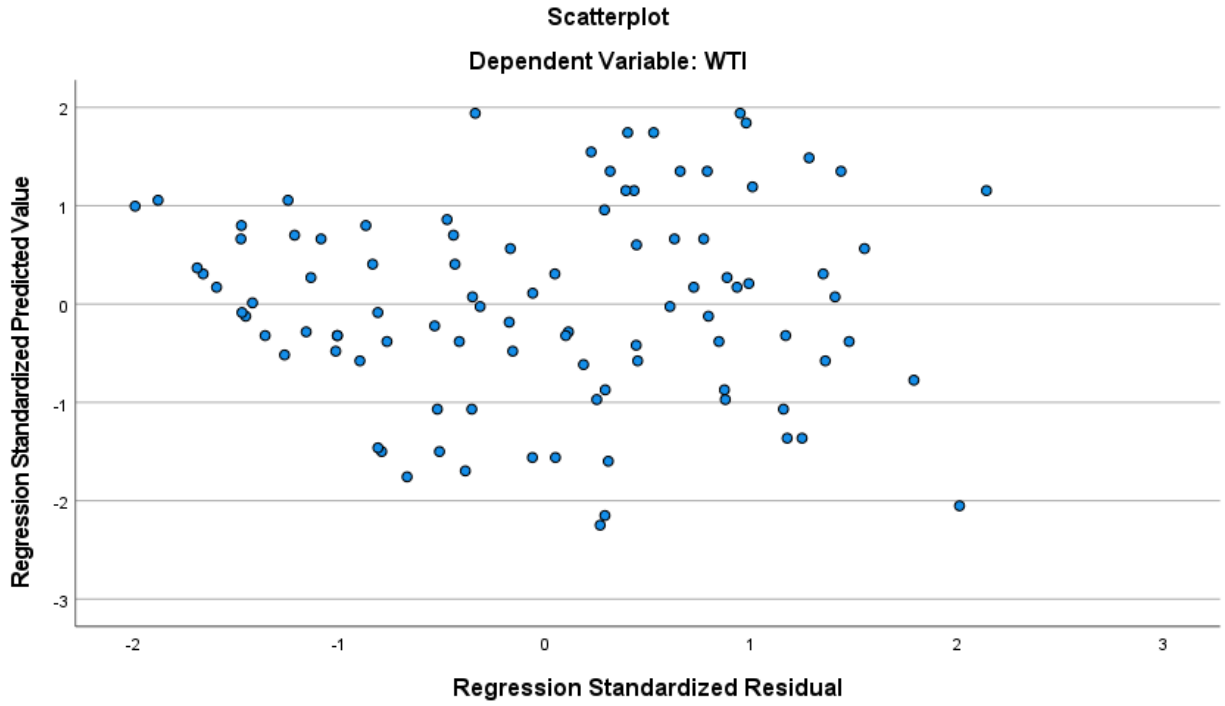


Figure 8: Scatterplot to test for heteroscedasticity.

I also checked for the multicollinearity assumption. The multicollinearity assumption would be violated if independent variables are too highly correlated with one another. After mean-centering *I-FoMO*, I note that all variance inflation factors (VIF) are significantly below 5 with the highest VIF being I-FoMO and equaling 1.947.

Collectively, given the analysis performed in this section, there does not appear to be any violations to the assumptions required to carry out a multiple linear regression model.

6.1.4 Test of Hypotheses

I tested my first three hypotheses using a multiple linear regression model with *Willingness to Invest* (*WTI*) regressed on *Investment Fear of Missing Out* (*I-FoMO*), *Staff Accounting Bulletin 121* (*SAB121*) and their respective interaction term which

yielded a significant predictive model $F(3,91) = 10.383$, $p < .01$, $R^2 = .255$. The moderated multiple linear regression model is given by the equation below:

$$WTI = b_0 + b_1 I - FoMO + b_2 SAB121 + b_3 I - FoMO \; X \; SAB121$$

Following the procedures described by Hayes (2022), I conducted a moderated multiple linear regression analysis using the R PROCESS macro (Model 1). Table 4 reports the regression results.

	Dependent Variable:
	WTI
I-FoMO	18.014***
	(3.508)
SAB121	-6.391
	(4.745)
SAB121 X I-FoMO	-14.275***
	(5.078)
Constant	38.169***
	(3.336)
Observations	95
R^2	0.255
Adjusted R^2	0.230
Residual Std. Error	22.916 (df=91)
F Statistic	10.383*** (df = 3; 91)

Note: *p<0.1; **p<0.05; ***p<0.01
Ordinary Least Squares (OLS) estimates are presented, followed by the standard errors (SE) in the parentheses below.
WTI - Participant's willingness to invest is calculated by averaging a participants response to the following three questions: "How attractive is an investment in Crypto Inc?" with endpoints 0 ("Extremely unattractive") and 100 ("Extremely attractive"); "How likely are you to invest in Crypto Inc?" with endpoints 0 ("Extremely unlikely") and 100 ("Extremely likely"); and "Assume you have $10,000 USD to invest. How much of these funds will you invest in Crypto Inc?" with endpoints 0 ("Nothing at all") and 10,000 ("Entire amount"). I rescaled the third question such that all three questions are on the same 101-point scale.
I-FoMO - Measured using a 10-item scale developed and validated by Clor-Proell et al. (2020). The variable was mean centered prior to the analysis.
SAB121 - Dummy coded such that 0 signifies the absence of SAB 121 and 1 signifies the presence of SAB 121.

Table 4: Ordinary Least Squares Regression Results

In support of H_1, *I-FoMO* had a significant positive relationship with *WTI*, suggesting that for every one unit increase in *I-FoMO*, individuals' willingness to invest increased by 18.014%, $b = 18.014$, $t(91) = 5.135$, $p < .01$. Contrary to what I hypothesized in H_2, the presence - as compared to the absence - of *SAB121* did not have a significant negative relationship with *WTI*, $p = 0.181$. Consistent with H_3, The interaction term was also significant, $b = -14.275$, $t(91) = -2.811$, $p < .01$, $R^2_{change} = .0647$. A simple slopes analysis (+/- 1 SD above and below the mean) revealed that the nature of the interaction was such that for low I-FoMO individuals, (about 2.263 [3.203 – 0.940]) the presence as compared to the absence of SAB 121 did not influence individuals' willingness to invest, $p = 0.297$. Similarly, for individuals with average levels of I-FoMO levels (about 3.203), the presence or absence of SAB 121 did not influence individuals' willingness to invest, $p = 0.181$. For high I-FoMO individuals, (4.1434 [3.203 + 0.940]), the presence of SAB 121 severely reduced individuals' willingness to invest such that individuals exposed to SAB 121 were 19.81% less willing to invest as compared to individuals that were not exposed to the disclosure, $b = -19.813$, $t(91) = -2.932$, $p < .01$. Figure 7 plots the simple slopes for the interaction. A Johnson-Neyman analysis[24] revealed that when an individual's level of I-FoMO is at around 3.437, the negative relationship between SAB 121 and an individual's willingness to invest became significant, $b = -9.735$, $t(91) = -1.98$, $p = .05$. As I-FoMO increased, the negative relationship between SAB 121 and an individual's willingness to invest increased accordingly, with individuals having I-FoMO levels of 5 being the least willing to invest, $b = -32.041$, $t(91) = -3.106$, $p < .01$. Therefore, the

[24] Given that probing the interaction at -1 SD below the mean, at the mean, and at +1 SD above the mean has been argued to be arbitrary (Hayes, 2022), I verified the simple slopes results using the Johnson–Neyman (JN) technique, dubbed a floodlight analysis by Spiller et al. (2013) as this provides more precise and rigorous conclusions on the ranges of statistical significance.

results support H_1 and H_3. However, for H_2, I do not find evidence to support the hypothesis.

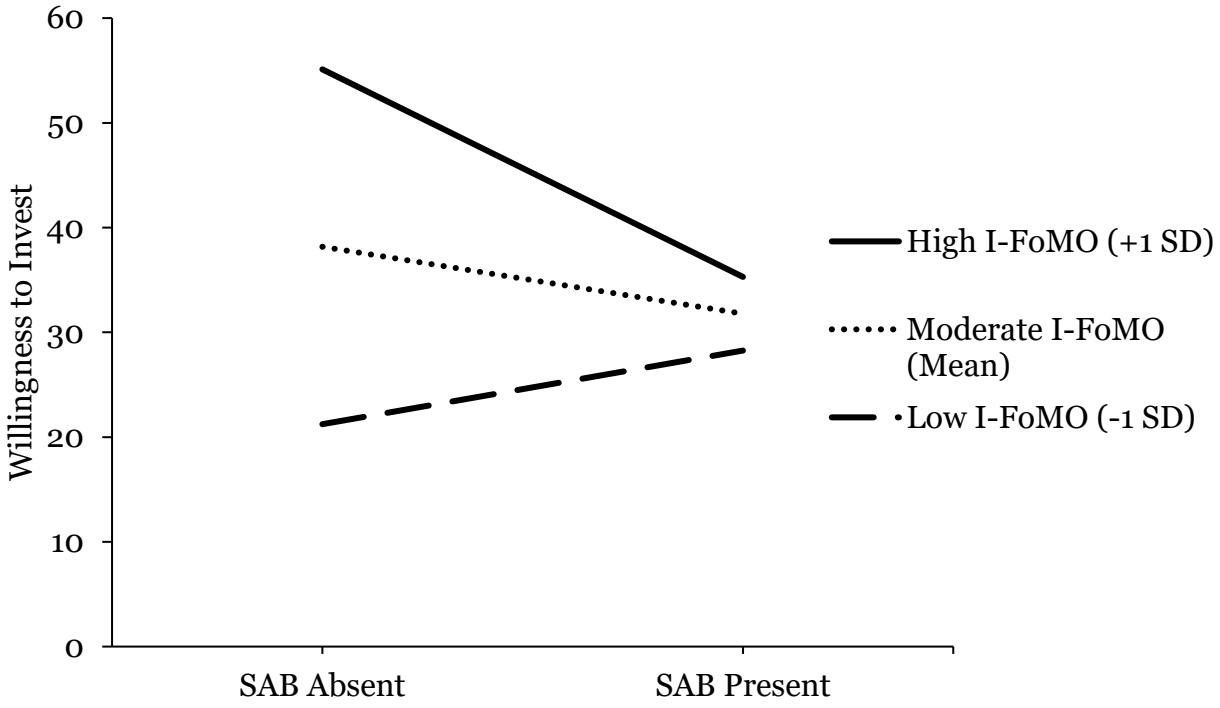


Figure 9: Observed effects of SAB 121 and I-FoMO on willingness to invest. See notes to Table 2 for descriptions of dependent variable and independent variables.

6.1.5 Robustness Checks

As a robustness check, I performed the moderated regression analysis presented in Table 4 using alternative operationalizations of the dependent variable, willingness to invest. In Table 5, I present the results according to the three questions comprising the dependent variable measure. Accordingly, Model 1 measures willingness to invest according to participants' response to the question: "Assume you have $10,000 USD to invest. How much of these funds will you invest in Crypto Inc?" with endpoints $0 ("Nothing at all") and $10,000 ("Entire amount"). Model 2 measures participant's willingness to invest according to participant's response to the question: "How likely are you to invest in Crypto Inc?" with endpoints 0 ("Extremely unlikely") and 100

("Extremely likely"). Lastly, Model 3 measures willingness to invest according to participant's response to the question: "How attractive is an investment in Crypto Inc?" with endpoints 0 ("Extremely unattractive") and 100 ("Extremely attractive").

	Dependent Variable:		
		WTI	
	Model 1	Model 2	Model 3
I-FoMO	1,556.235***	19.680***	18.799***
	(315.889)	(4.233)	(4.262)
SAB121	-775.116*	-4.774	-6.649
	(427.320)	(5.727)	(5.765)
SAB121 X I-FoMO	-1,225.983***	-14.473**	-16.092**
	(457.307)	(6.129)	(6.170)
Constant	2,533.914***	41.603***	47.566***
	(300.413)	(4.026)	(4.053)
Observations	95	95	95
R-Squared	0.254	0.215	0.198
Adjusted R-Squared	0.229	0.189	0.172
Residual Std. Error	2,063.573 (df=91)	27.656 (df=91)	27.840 (df=91)
F Statistic	10.318*** (df = 3; 91)	8.305*** (df = 3; 91)	7.496*** (df = 3; 91)

Note: *p<0.1; **p<0.05; ***p<0.01
Ordinary Least Squares (OLS) estimates are presented, followed by the standard errors (SE) in the parentheses below.
Model 1 - Participant's willingness to invest measured based on participant's response to the question: "Assume you have $10,000 USD to invest. How much of these funds will you invest in Crypto Inc?" with endpoints 0 ("Nothing at all") and 10,000 ("Entire amount").
Model 2 - Participant's willingness to invest measured based on participant's response to the question: "How likely are you to invest in Crypto Inc?" with endpoints 0 ("Extremely unlikely") and 100 ("Extremely likely").
Model 3 - Participant's willingness to invest measured based on participant's response to the question: "How attractive is an investment in Crypto Inc?" with endpoints 0 ("Extremely unattractive") and 100 ("Extremely attractive").
I-FoMO - Measured using a 10-item scale developed and validated by Clor-Proell et al. (2020). The variable was mean centered prior to the analysis.
SAB121 - Dummy coded such that 0 signifies the absence of SAB 121 and 1 signifies the presence of SAB 121.

Table 5: Ordinary Least Squares Regression Results

Using the alternative operationalizations of the dependent variable, I find support for H_1, given that *I-FoMO* had a significant positive relationship with *WTI*, suggesting that for every one unit increase in *I-FoMO*, individuals' willingness to invest increased by $1,556.235 for model 1, b = 1,556.235, $t(91) = 4.927$, $p < .01$, by 19.680% for model 2, b = 19.680, $t(91) = 4.649$, $p < .01$ and by 18.799% for model 3, b = 18.799, $t(91) = 4.411$, $p < .01$. This suggests that regardless of the operationalization of *WTI*, H_1 is supported.

Consistent with the main findings reported, H_2 is not supported for model 2, p = 0.407 and model 3, p = 0.252 but is marginally supported for model 1, b = -755.116, $t(91) = -1.814$, $p < .10$ suggesting that investors' willingness to invest decreases by $755.116 when they are exposed to SAB 121 as compared to the baseline condition of no SAB 121. This suggests that the operationalization of *WTI*, may affect H_2 given that the main analysis in Table 2 and the robustness checks in Table 3 for model 2 and model 3 do not provide statistical significance but model 1 provides marginal significance.

The interaction term was significant for model 1, b = -12,225.983, $t(91) = -2.681$, $p < .01$, $R^2_{change} = .0589$, model 2, b = -4.473, $t(91) = -2.362$, $p < .05$, $R^2_{change} = .0481$ and model 3, b = -16.092, $t(91) = -2.608$, $p < .05$, $R^2_{change} = .0599$. A simple slopes analysis (+/- 1 SD above and below the mean) revealed that the nature of the interaction was such that for low I-FoMO individuals, (about 2.263 [3.203 – 0.940]) the presence as compared to the absence of SAB 121 did not influence individuals' willingness to invest, p = 0.533 (model 1), p = 0.278 (model 2), p = 0.301 (model 3). Similarly, for individuals with average levels of I-FoMO levels (about 3.203), the presence or absence of SAB 121 did not influence individuals' willingness to invest, p = 0.073 (model 1), p = 0.407

(model 2), p = 0.252 (model 3). For high I-FoMO individuals, (4.1434 [3.203 + 0.940]), the presence of SAB 121 severely reduced individuals' willingness to invest relative to SAB such that individuals exposed to SAB 121 were $1,927.89 (model 1), 18.38% (model 2), and 21.78% (model 3) less willing to invest as compared to individuals that were not exposed to the disclosure, model 1: b = -1,927.892, $t(91)$ = -3.168, p < .01, model 2: b = -18.382, $t(91)$ = -2.254, p < .05 and model 3: b = -21.779, $t(91)$ = -2.653, p < .01. This suggests that regardless of the operationalization of *WTI*, H_3 is supported.

6.1.6 Supplementary Analysis

Prior research has demonstrated that conceptually FoMO in a social context differs substantially from FoMO in an investing context. Whereas for social FoMO the outcome is psychological well-being, for investment FoMO (I-FoMO) it is the potential monetary reward (Clor-Proell et al., 2020). In addition, social FoMO and I-FoMO may not always be correlated to one another if an individual places a high value on social experiences but not on monetary experiences or vice versa (Kasser & Ryan, 1993). As such, I-FoMO as a construct, highlights individual's propensity to experience negative emotions (e.g., fear and anxiousness) pertaining to missing out on a potential monetary reward (Clor-Proell et al., 2020).

In order to highlight the conceptual differences between FoMO in a social context and FoMO in an investing context, I collected participants social FoMO using the scale developed and validated by Przybylski et al (2013). Following the procedures described by Hayes (2022), I conducted a moderated multiple linear regression analysis using the R PROCESS macro (Model 1) with *Willingness to Invest* (*WTI*) regressed on social *Fear of Missing Out* (*FoMO*), *Staff Accounting Bulletin 121* (*SAB*) and their respective

interaction term which yielded a significant predictive model $F(3,91) = 4.922$, $p < .01$, $R^2 = .139$. However, inconsistent with my previous findings that SAB 121 is an effective attenuator of I-FoMO, I do not find support for H_3 when operationalizing FoMO using Przybylski et al (2013)'s social FoMO scale, $p = 0.465$. This result highlights - from an empirical perspective - the difference between social FoMO and investment FoMO. Considering that the experimental design is contextualized in an investment environment, it is expected that SAB 121 would influence investors decision making depending on their level of investment FoMO but not on the level of social FoMO. Overall, this supports the conceptual idea that social FoMO and investment FoMO are distinct constructs.

6.1.7 Summary

In summary, the findings provide evidence that individuals with higher levels of I-FoMO are more willing to invest in the shares of crypto-asset platforms thereby supporting H_1. In addition, individuals exposed to SAB 121 appear to be directionally less willing to invest in the shares of the crypto-asset platform as compared to individuals not exposed to the disclosure. However, given that statistical significance was not established, I failed to find support for H_2. Finally, I find that for high I-FoMO individuals, the effect of SAB 121 on their willingness to invest is significant whereas for low I-FOMO individuals no statistical significance is found. Hence, the findings support H_3. The results suggest that SAB 121 acts as an effective attenuator of risk-taking behaviour in high I-FoMO individuals.

Building on Experiment 1, which established the main effects and interactions of the variables of interest, the subsequent experiment seeks to disentangle the mechanism

by which SAB 121 affects investors' willingness to invest for high I-FoMO (but not low I-FoMO) individuals by using a larger sample size.

6.2 Experiment 2

6.2.1 Participants

A total of 454 participants completed the experiment. As discussed in Section 5.2.8, I excluded participants who failed the attention check and/or the instructional comprehension check. As such, the final sample size was reduced to 412 subjects. Table 6 provides a summary of participant demographics. Participants varied between the ages of 18 and 73 with a mean age of 35.5 (*SD* = 11.4) and 80% were male. In terms of formal education, 73% of participants reported to have obtained either a 4-year degree, professional degree, or doctorate but more than 85% of participants reported to have taken less than 4 courses in accounting and finance at the college level. Over 76% of the participants had at least 5 years of work experience and over 54% had at least 5 years of investing experience.

	Range	Number	Percentage	Cumulative Percentage
Education:	Less than high school	1	0.2%	0.2%
	High school graduate	29	7.0%	7.3%
	Some college	57	13.8%	21.1%
	2-year degree	23	5.6%	26.7%
	4-year degree	172	41.7%	68.4%
	Professional degree	115	27.9%	96.4%
	Doctorate	13	3.2%	99.5%
	Did Not Report	2	0.5%	100.0%
Work Experience:	None	14	3.4%	3.4%
	1 - 4	84	20.4%	23.8%
	5 - 8	82	19.9%	43.7%
	9 - 12	52	12.6%	56.3%
	12+	176	42.7%	99.0%
	Did Not Report	4	1.0%	100.0%
Investing Experience:	0 - 1	13	3.2%	3.2%
	2 - 4	176	42.7%	45.9%
	5 - 7	102	24.8%	70.6%
	7 - 9	33	8.0%	78.6%
	10+	85	20.6%	99.3%
	Did Not Report	3	0.7%	100.0%
College Level Accounting Courses:	None	191	46.4%	46.4%
	1 - 4	165	40.0%	86.4%
	5 - 8	26	6.3%	92.7%
	9 - 12	10	2.4%	95.1%
	12+	18	4.4%	99.5%
	Did Not Report	2	0.5%	100.0%
College Level Finance Courses:	None	173	42.0%	42.0%
	1 - 4	180	43.7%	85.7%
	5 - 8	28	6.8%	92.5%
	9 - 12	9	2.2%	94.7%
	12+	19	4.6%	99.3%
	Did Not Report	3	0.7%	100.0%
Gender:	Male	330	80.1%	80.1%
	Female	80	19.4%	99.5%
	Non-binary / third gender	1	0.2%	99.8%
	Did Not Report	1	0.2%	100.0%
Age:	35.5			

Table 6: Participant Demographics [n = 412] by Range, Number, Percentage, and Cumulative Percentage.

6.2.2 Outlier Analysis

Outliers are defined as anomalous observations with values that are inconsistent with the distribution of other observations in the data set (Mazzocchi, 2008). I assessed the data set for outliers based on three commonly used measures, namely leverage[25], Mahalanobis Distance[26] and Cook's Distance[27]. Given that each statistic defines an observation as an outlier differently, to be conservative, I classify an outlier as a data point that is flagged as an outlier under at least two of the three measures. I did not find any observations meeting this requirement and, as such, I concluded that outliers were not present in the data set.

6.2.3 Testing for Basic Regression Assumptions

Prior to conducting the statistical analysis, I performed procedures to ensure that the data set meets the basic assumptions of statistical analysis (LaMothe & Bobek, 2017). These assumptions include normality, heteroscedasticity, linearity, and independence.

I created a normal probability plot (i.e., a P-P plot) by graphing the cumulative probability of *Willingness to Invest* (i.e., the dependent variable) against the cumulative probability of a normal distribution. The plot ranks and sorts observations and then assigns a z-score corresponding to the rank of each observation. The z-score is then plotted against a standardized z-score of the observed values. As observed by the P-P

[25] Data points with high leverage have unusual x-values but do not necessarily affect regression coefficients. The threshold of whether an observation is considered an outlier is $\frac{2(K)+2}{N}$ where K is the number of independent variables and N is the total sample size. Observations with leverage values above the threshold are classified as outliers.

[26] Mahalanobis Distance is a measure to classify multivariate outliers which computes the multivariate distance of an observation from the mean center of all observations (Mahalanobis, 1936). Mahalanobis Distance follows a chi-square distribution. Observations that are three standard deviations or greater from the centroid are classified as outliers.

[27] Cook's Distance is a measure of influence and estimates the variation in regression coefficients after removing each observation, one by one (Cook, 1977). The threshold of whether an observation is considered an outlier is $\frac{4}{N-K-1}$ where K is the number of independent variables and N is the total sample size. Observations with Cook Distance values above the threshold are classified as outliers.

plot in Figure 10, deviations from normality do not appear to be present given that the normal probability plot graphs a straight diagonal line of observations.

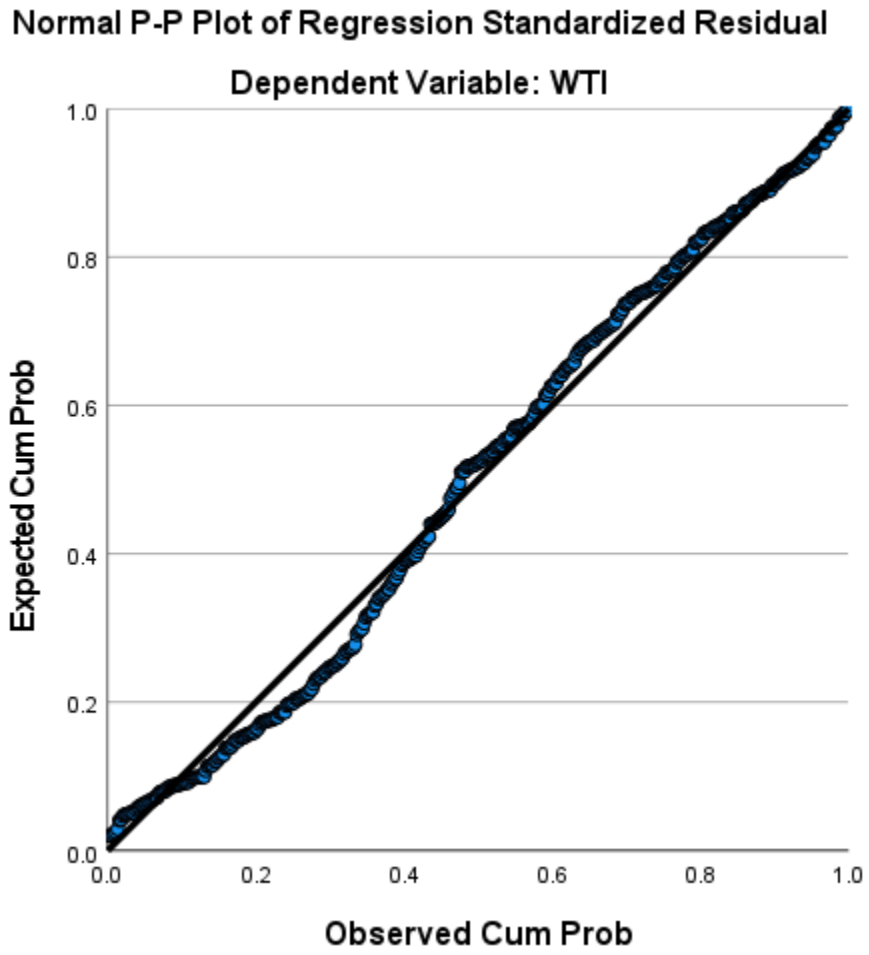


Figure 10: Normal probability plot of Willingness to Invest.

I created a scatterplot of regression standardized residuals versus regression standardized predicted values for *Willingness to Invest* to check for the heteroscedasticity assumption. Heteroscedasticity occurs when variation in a dependent variable is non-constant across different levels of a predictor variable or groups (Hair et al., 2010). I note that the data set does not violate the heteroscedasticity assumption

given that the scatterplot on Figure 11 is not characterized by a specific shape such as a cone or a diamond.

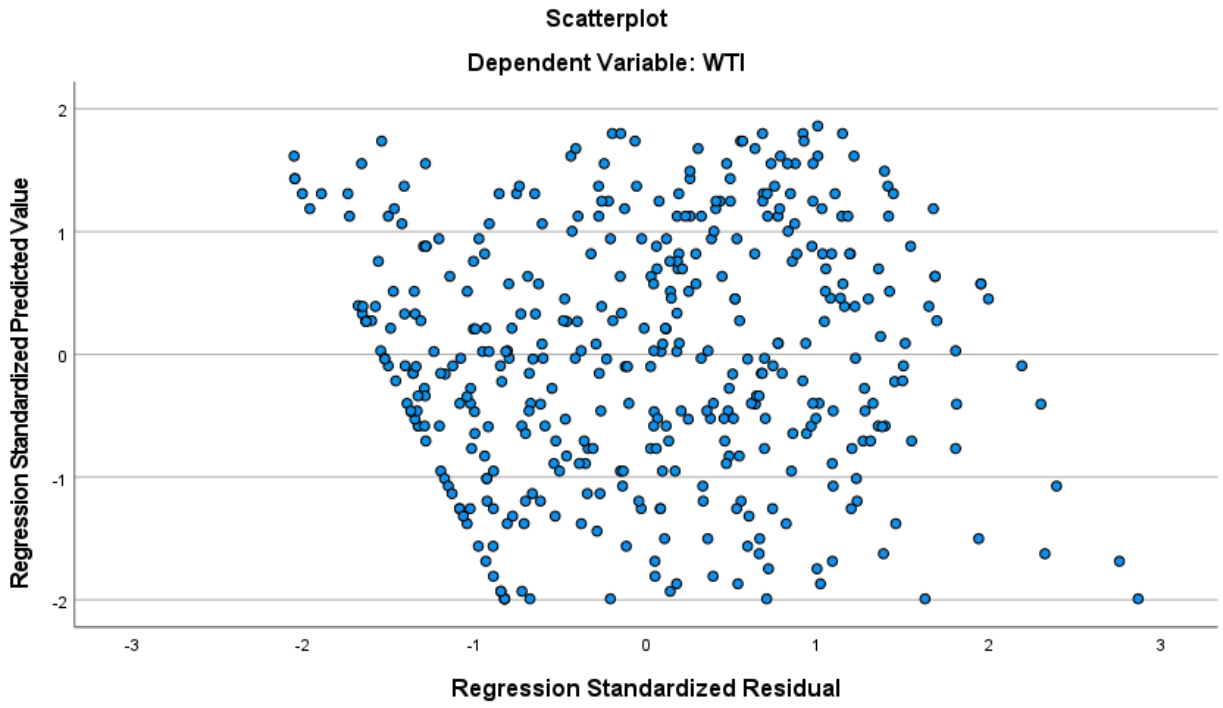


Figure 11: Scatterplot to test for heteroscedasticity.

I also checked for the multicollinearity assumption. The multicollinearity assumption would be violated if independent variables are too highly correlated with each other. After mean-centering *I-FoMO*, I note that all variance inflation factors (VIF) are significantly below 5 with the highest VIF being for I-FoMO equaling 1.012.

Collectively, given the analysis performed in this section, there did not appear to be any violations to the assumptions required to carry out a multiple linear regression model.

6.2.4 Test of Hypotheses

I tested my first three hypotheses using a multiple linear regression model with *Willingness to Invest* (*WTI*) regressed on *Investment Fear of Missing Out* (*I-FoMO*), *Staff Accounting Bulletin 121* (*SAB121*) and their respective interaction term which yielded a significant predictive model $F(3,408) = 18.978$, $p < .01$, $R^2 = .122$. The moderated multiple linear regression model is given by the equation below:

$$WTI = b_0 + b_1 I - FoMO + b_2 SAB121 + b_3 I - FoMO \; X \; SAB$$

Following the procedures described by Hayes (2022), I conduct a moderated multiple linear regression analysis using the R PROCESS macro (Model 1). Table 7 reports the regression results.

	Dependent Variable:
	WTI
I-FoMO	8.733***
	(1.895)
SAB	-13.494***
	(2.675)
SAB X I-FoMO	-5.178**
	(2.572)
Constant	48.281***
	(1.924)
Observations	412
R^2	0.122
Adjusted R^2	0.116
Residual Std. Error	26.963 (df=408)
F Statistic	18.978*** (df = 3; 408)

Note: *p<0.1; **p<0.05; ***p<0.01
Ordinary Least Squares (OLS) estimates are presented, followed by the standard errors (SE) in the parentheses below.
WTI - Participant's willingness to invest is calculated by averaging a participants response to the following three questions: "How attractive is an investment in Crypto Inc?" with endpoints 0 ("Extremely unattractive") and 100 ("Extremely attractive"); "How likely are you to invest in Crypto Inc?" with endpoints 0 ("Extremely unlikely") and 100 ("Extremely likely"); and "Assume you have $10,000 USD to invest. How much of these funds will you invest in Crypto Inc?" with endpoints 0 ("Nothing at all") and 10,000 ("Entire amount"). I rescale the third question such that all three questions are on the same 101-

point scale.
I-FoMO - Measured using a 10-item scale developed and validated by Clor-Proell et al. (2020). The variable was mean centered prior to the analysis.
SAB - Dummy coded such that 0 signifies the absence of SAB 121 and 1 signifies the presence of SAB 121.

Table 7: Ordinary Least Squares Regression Results

In support of H_1, *I-FoMO* had a significant positive relationship with *WTI*, suggesting that for every one unit increase in *I-FoMO*, individuals' willingness to invest increased by 8.73%, $b = 8.73$, $t(408) = 4.609$, $p < .01$. Furthermore, consistent with H_2, the presence - as compared to the absence - of *SAB121* had a significant negative relationship with *WTI* given that individuals' willingness to invest decreased by 13.49% when SAB 121 was present, $b = 13.49$, $t(408) = -5.045$, $p < .01$. Consistent with H_3, The interaction term was also significant, $b = -5.178$, $t(408) = -2.013$, $p < .05$, $R^2_{change} = .0087$. A simple slopes analysis (+/- 1.5 SD above and below the mean) revealed that the nature of the interaction was such that for low I-FoMO individuals, (about 1.579 [3.145 – 1.566]) the presence as compared to the absence of SAB did not influence individuals' willingness to invest, $p = 0.269$. For individuals with average levels of I-FoMO (about 3.145), the presence of SAB 121 reduced individuals' willingness to invest such that individuals exposed to SAB 121 were 13.49% less willing to invest as compared to individuals that were not exposed to the disclosure, $b = -13.494$, $t(408) = -5.045$, $p < .01$. For high I-FoMO individuals (4.771 [3.145 + 1.566]), the presence of SAB 121 severely reduced individuals' willingness to invest such that individuals exposed to SAB 121 were 21.61% less willing to invest as compared to individuals that were not exposed to the disclosure, $b = -21.605$, $t(408) = -4.495$, $p < .01$. Figure 12 plots the simple slopes

for the interaction. A Johnson-Neyman analysis[28] revealed that when an individual's level of I-FoMO is at around 2.035, the negative relationship between SAB 121 and an individual's willingness to invest became significant, b = -7.743, $t(408) = -1.97$, $p = .05$. As I-FoMO increased, the negative relationship between SAB 121 and an individual's willingness to invest increased accordingly, with individuals having I-FoMO levels of 5 being the least willing to invest, b = -23.097, $t(408) = -4.248$, $p < .01$. Therefore, based on the analysis carried out, I find support for H_1, H_2, and H_3.

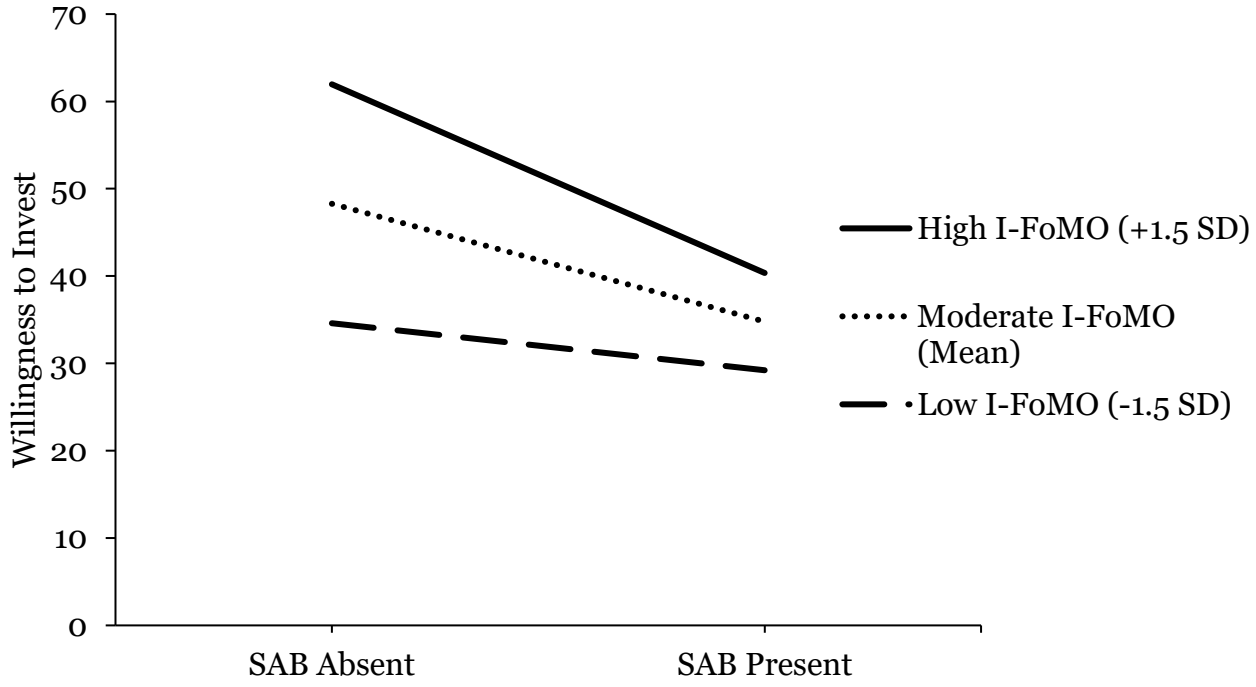


Figure 12: Observed effects of SAB 121 and I-FoMO on willingness to invest. See notes to Table 7 for descriptions of dependent variable and independent variables.

6.2.5 Moderated Mediation Analysis

Following the procedures described by Hayes (2022), I conducted a moderated mediation analysis using the R PROCESS macro (Model 8) with a 95% confidence

[28] I probed the interaction at -1.5 SD below the mean, at the mean, and at +1.5 SD above the mean given that probing the interaction at -1 SD below the mean, at the mean, and at +1 SD above the mean has been argued to be arbitrary (Hayes, 2022). In addition, I verified the simple slopes results using the Johnson–Neyman (JN) technique as this provides more precise and rigorous conclusions on the ranges of statistical significance.

interval (CI) bootstrap sample of 10,000. Figure 13 illustrates the model I tested whereby *SAB121* is denoted by *X*, *I-FoMO* is denoted by *W*, *perceived risk* is denoted by *M* and *WTI* is denoted by *Y*.

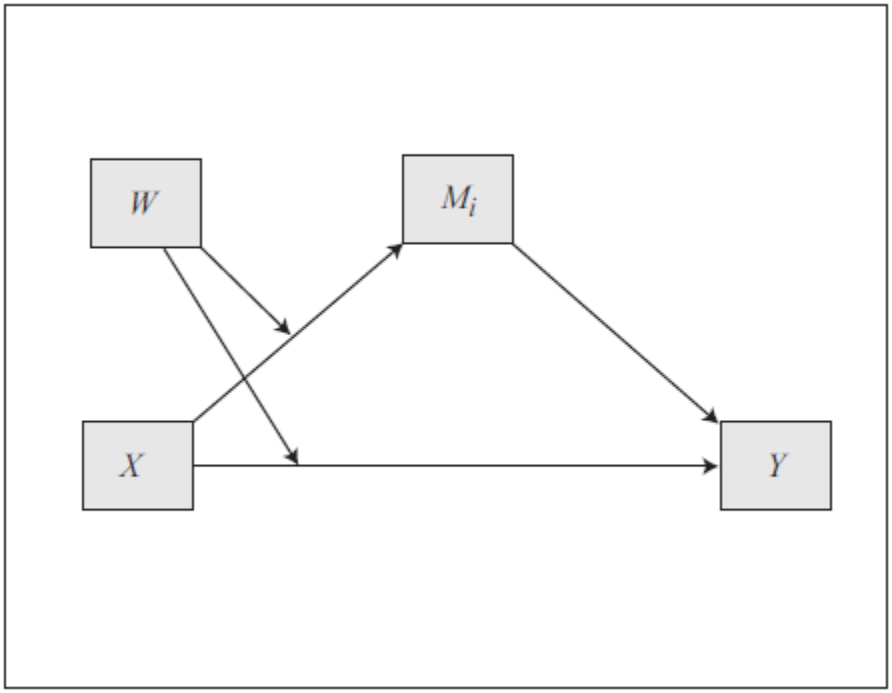


Figure 13: Graphical representation of Hayes' Model 8 (Hayes, 2013).

In H_4, I predicted that the indirect effect of Staff Accounting Bulletin 121 (SAB121) on a participant's willingness to invest (WTI) through risk perception will be moderated by the participant's level of Investment Fear of Missing Out (I-FoMO). Contrary to the prediction, I did not find support for this hypothesis given that the index of moderated mediation was not significant (B = 0.423; 95% CIs [-2.645; 3.603]), suggesting that the indirect effect of SAB 121 on WTI through risk perception was not conditional on an individual's level of I-FoMO. Therefore, I do not find support for H_4.

6.2.6 Exploratory Analysis

In this chapter, thus far, I have reported my findings consistent with the pre-registration time-stamped document outlined in Section 6.3. Having said this, the pre-registration process does not prohibit researchers from exploring the data and sharing exploratory findings as long as the researchers are transparent and acknowledge that the discovery is exploratory in nature (Simmons et al., 2021). In this section, I perform exploratory analysis to obtain a deeper understanding of the process that could underlie Hypothesis 2, that is, the reason why investors would be less willing to invest in the presence rather the absence of SAB 121.

The theoretical argument for Hypothesis 2 relies on the premise that investors who view SAB 121 are more likely to view an investment in the crypto-asset platform as having a higher risk profile as compared to investors who do not view the disclosure. As such, I would expect an investor's risk perception to influence their willingness to invest in the crypto-asset platform.

I conducted a mediation analysis to explore my exploratory causal mechanism (bias corrected bootstrapped with 10,000 draws; Hayes 2018; model 4). Figure 14 depicts the model tested along with the regression coefficients for the a-path, b-path, c-path and c'-path along with the statistical significance of each coefficient. The results yielded a significant indirect effect of the presence/absence of SAB 121 on investors willingness to invest through investors risk perception (B = -4.461; 95% CI [-7.743; -1.293]). Thus, the negative relationship between the presence of SAB 121 and investors willingness to invest appears to be mediated by investors risk perception.

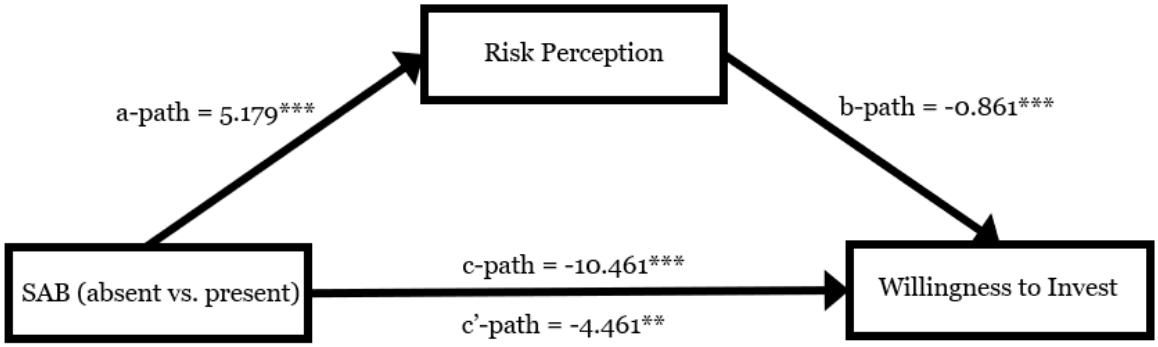


Figure 14: Mediation analysis using Hayes PROCESS Model 4. Unstandardized estimates are provided. *p<0.1; **p<0.05; ***p<0.01.

6.2.7 Summary

In summary, the findings provide evidence that individuals with higher levels of I-FoMO are more willing to invest in the shares of crypto-asset platforms thereby supporting H_1. In addition, the results show that individuals exposed to SAB 121 are less willing to invest in the shares of the crypto-asset platform as compared to individuals not exposed to the disclosure. Finally, I find that for high I-FoMO individuals, the effect of SAB 121 on their willingness to invest is significant whereas for low I-FOMO individuals no statistical significance is found. Hence, the findings support H_3. The results suggest that SAB 121 acts as an effective attenuator in high I-FoMO individuals. Lastly, contrary to what I predicted in H_4, I do not find support to suggest that the indirect effect of SAB 121 on willingness to invest through risk perception is conditional on an individual's level of I-FoMO. Having said this, exploratory analysis confirms that the underlying reason why investors are less willingness to invest in the presence rather than the absence of SAB 121 is due to higher risk perception.

Overall, the findings from Experiment 2 confirm the findings obtained in Experiment 1. In addition, the exploratory analysis provides a foundational

understanding for the mechanism to explain why SAB 121 decreases investors willingness to invest in a crypto-asset platform.

Chapter 7: Discussion and Conclusions

7.1 Overview

The purpose of this chapter is to provide a discussion and conclusion on the findings from the two experiments that I conducted.

This chapter is organized as follows. In Section 7.2, I discuss the findings from Experiment 1 and Experiment 2 pertaining to the four hypotheses that had been postulated. In Section 7.3, I discuss the implications of the findings for regulators, investors, and for accounting research. In Section 7.4, I discuss the limitations and the future research opportunities arising from this dissertation.

7.2 Discussion of Hypotheses Testing

My dissertation uses two complementary experiments to provide original evidence as to how SAB 121 affects investors judgment and decision making while taking into consideration varying levels of investor FoMO with the aim of focusing on investors with high levels of FoMO – a group about which the SEC has expressed concerns (SEC, 2021a).

7.2.1 Experiment 1

The findings of Experiment 1 suggest that investors with higher levels of FoMO are more willing to invest in the digital asset space. This is consistent with prior literature that has argued that the risky nature of the crypto-asset environment is a key factor in attracting investors with similar trait qualities as investors in lottery stocks (Kumar, 2009), penny stocks (Leuz, Meyer, Muhn, Soltes, & Hackethal, 2017), persons that like to gamble (Dorn, Dorn, & Sengmueller, 2015) or those who see trading as

entertainment (Dorn & Sengmueller, 2009). The fear of missing out on financial gains is another feature that assimilates and associates online sports betting (e.g., the belief that one could be missing a good bet) with the cryptocurrency environment (Delfabbro, et al., 2021a). Delfabbro et al. (2021a) argued that FoMO is a risk factor for excessive crypto trading. Recent research has noted several similarities between speculative trading and gambling. For example, a machine learning textual analysis of gambling self-support online forum found that investing topics were among the ten most prominent themes that emerged from the data (Bradley & James, 2020). Gambling rates are higher for individuals who engage in stock market and crypto-asset trading (Delfabbro et al., 2021b). Furthermore, frequent speculative trading and gambling can be attributed to the same personality traits, namely overconfidence, impulsiveness and sensation seeking (Dickerson, Hinchy, Fabre, & Chasing, 1987; Grinblatt & Keloharju, 2009; Barber & Odean, 2002). From the innate characteristics of speculative trading and gambling, it is evident that the influence of chance and risk of loss is an inherent characteristic of both behaviours. The largely unregulated nature of the current-state of the crypto-asset environment has contributed to speculative trading among some investors who have been reported to trade based on FoMO and who have suffered from 'pump and dump' schemes and other types of activities (Barnes, 2018).[29] These types of schemes are possible, in large part, due to the unregulated nature of cryptocurrency exchanges and the fact that they are difficult to police (Barnes, 2018).

[29] For example, in a 'Pump and Dump' scheme, organizers of the scheme argue that the recent price spike in a given crypto-asset is sustainable and promote the crypto-asset on social media. The promoters argue that smart traders should get in before the coin goes 'to the moon'. the sudden and large increase in price triggers FoMO in investors, which causes investors to purchase the coin. After investors purchase the coin, they subsequently see the cryptocurrency's price collapse after the organizers decide to dump the coin when the price is at the top (Barnes, 2018).

Contrary to the prediction hypothesized in H_2 which suggested that investors with higher levels of I-FoMO are more willing to invest in the digital asset environment, it remains inconclusive as to whether SAB 121 has a direct effect on investors. Although I did not find a direct effect of SAB 121 on investors willingness to invest in the shares of the crypto-asset platform in the main analysis, robustness checks showed that the operationalization of investor's judgment (i.e., the dependent variable) could affect whether SAB 121 influences investors. As such, from Experiment 1, it remains inconclusive whether SAB 121 influences investors. However, from the results obtained, regardless of the operationalization utilized for investors judgment and decision making, a directionally negative relationship was observed between the presence of SAB 121 and investors' willingness to invest suggesting that being exposed to SAB 121 reduces investors' willingness to invest. A more detailed discussion on this effect can be found in the next section where I discuss the results of Experiment 2.

Although the findings for the direct effect of SAB 121 on investor's judgment and decision making are inconclusive, I find a conditional effect of SAB 121 on investors willingness to invest in the shares of crypto-asset platforms depending on the investor's level of I-FoMO. For high I-FoMO investors, the effect of SAB 121 on their willingness to invest is significant such that the presence (as compared to the absence) of SAB 121 severely reduces investors' willingness to invest. On the other hand, low I-FoMO investors do not appear to be influenced by the presence/absence of SAB 121. Given the SEC's three-part mission which includes: "to protect investors, maintain fair, orderly, and efficient markets, and facilitate capital formation" (SEC, n.d.) and the fact that it has raised concerns for the vulnerability of high FoMO investors in the crypto-asset

environment (SEC, 2021a), this result suggests that SAB 121 acts as an effective attenuator in risk-taking behaviour in high I-FoMO individuals.

7.2.2 Experiment 2

Building on the findings obtained in Experiment 1, the objective of Experiment 2 was two-fold. The first objective was to replicate the results of Experiment 1. Given recent concerns about the replicability of research findings in many disciplines (e.g., Camerer et al., 2018; Simmons et al., 2020) the scientific community has emphasized the importance of carrying out replication studies to assert whether the original findings can be relied upon (Brandt et al., 2014; Camerer et al., 2018). As such, the replication of the results obtained in Experiment 1 increase the reliability of the findings. The second objective was to elucidate the mechanism to explain why SAB 121 impacts high I-FoMO investors' decision making.

Consistent with the findings of Experiment 1, I find that investors with higher levels of I-FoMO are more willing to invest in the crypto-asset space. Furthermore, I find a conditional effect of SAB 121 on investors willingness to invest in the shares of crypto-asset platforms depending on the investor's level of I-FoMO. For high I-FoMO individuals, the effect of SAB 121 on their willingness to invest is significant such that the presence (as compared to the absence) of SAB 121 severely reduces investor's willingness to invest. On the other hand, low I-FoMO individuals do not appear to be influenced by the presence/absence of SAB 121. These results are consistent not only with Experiment 1 but also with H_1 and H_3.

In Experiment 2 I find a significant main effect of SAB 121 on investors' willingness to invest such that, on average, in the presence of SAB 121 investors are

significantly less willing to invest in in the shares of crypto-asset platforms. Although the results from Experiment 1 remained inconclusive in relation to this main effect, Experiment 2 aids in confirming the relationship. A probable reason as to why Experiment 1 provided inconclusive results can be a lack of power to detect the effect. Given that Experiment 2 was performed with a substantially greater sample size, the ability to detect the effect substantially increased. In addition, from Experiment 1 the results highlighted the fact that regardless of the operationalization utilized for investors judgment and decision making, a directionally negative relationship was observed between the presence of SAB 121 and investors willingness to invest. As such, given that directionally Experiment 1 provided the same results as Experiment 2, the presence of statistical significance in Experiment 2 (and not in Experiment 1) can be an artifact of the smaller sample size (and thus lack of power) present in Experiment 1.

The second objective of the Experiment 2 was to elucidate the mechanism by which SAB 121 influences high FoMO investors but not low FoMO investors. Originally, I hypothesized that the relationship between SAB 121 on investors willingness to invest would be mediated by investors risk perception for high FoMO investors whereas for low FoMO investors no indirect effect would be present. Contrary to what I hypothesized; a significant association was not established for this relationship. There exists various reasons why this relationship may have been unsupported by the data.

From the practical design of the experiment, there are two primary reasons, namely statistical power, and the scaling of the risk perception construct. According to Cohen's (1988) guidelines, $f^2 \geq 0.02$, $f^2 \geq 0.15$, and $f^2 \geq 0.35$ represent small, medium, and large effect sizes, respectively. In my a-priori estimation of the effect size, I

estimated the effect size to be 0.03. Having said this, through a sensitivity analysis, I note that if the effect size was to equal 0.02 - the smallest effect size according to Cohen's (1988) guidelines – the required sample size would be 602, substantially larger than the 412 final sample size utilized in Experiment 2. To further demonstrate the inability to detect an effect should there be one given a sample size of 412, a calculation on G*Power shows that if the effect size was in-fact $f^2 = 0.02$, a total sample size of 412 would only provide a statistical power $(1 - \beta)$ of 0.61. As such, this would signify that I would only have a 61% probability of finding an effect should there be one. This is substantially below the standard 80% statistical power and much closer to the probability of obtaining heads when flipping a coin. In addition, the scaling of the risk perception variable may have contributed to the inability to establish statistical significance. In psychometric questionnaire design, it is a common practice to use Likert scales. The original scale that I used to measure risk perception was adapted from Faqih (2016). In the original scale, the scaling used was a 7-point measurement scale with endpoints of 1 ("strongly disagree") to 7 ("strongly agree"). However, in my experiment, I used a different set of endpoints ranging from 0 ("Strongly disagree") to 100 ("Strongly agree'). My reasoning behind this approach was to maintain consistency in the scaling of the various variables given that two of the three questions that I used to establish my dependent variables had 0 to 100 endpoints. However, by changing the scaling of the questions, it is possible that I may have altered the inherent characteristics of the scale given that it was originally validated as a 7-point scale. This may have thereby affected the measurement of risk perception by increasing the variance and therefore creating a more error-prone measure.

Although the conditional indirect effect of SAB 121 on investors willingness to invest through risk perception for high levels of FoMO but not for low levels of FoMO was not established, follow-up exploratory analysis did show that the reason why the presence of SAB 121 decreases investors' willingness to invest in the shares of the crypto-asset platform is due to a heightened risk perception. Overall, this is consistent with the idea that SAB 121 makes investors' risk perception more salient.

7.3 Implications

The findings from this dissertation have several important implications for regulators, investors, the accounting literature, and the FoMO literature.

Given that SAB 121 was issued by the SEC to aid investors' capital allocation following several crypto-exchange scandals, understanding the effectiveness of SAB 121 would be of interest to the SEC and other policy makers. Following the SEC's concerns over the effects that FoMO could have on digital asset investors (SEC, 2021a), this study provides empirical evidence to show that accounting regulation can mitigate FoMO and ultimately protect investors. As such, this study provides empirical evidence that could form the basis for future regulations in the crypto-asset environment.

The study also has important implications for investors as it underlies the importance of FoMO in the context of behavioural finance. The present study highlights the positive relationship between FoMO and investors propensity to invest in the digital asset environment, as expected, and indicated in the literature. As such, investors should be cognizant on how FoMO can impact their investment decisions prior to making capital allocation decisions. Furthermore, given that exposure to SAB 121 was demonstrated to increase investors risk perception and, therefore, decrease risk-taking

behaviour, investors should collect all relevant information prior to making investment decisions.

This study also contributes to research related to digital asset financial reporting, an area within the academic accounting literature with limited number of publications (Pimentel & Boulianne, 2020). This dissertation provides an in-depth look at SAB 121 which, by nature, comprises financial reporting guidance for entities safeguarding clients' crypto-assets and maintaining the cryptographic key information necessary to access these assets. As such, the result of this study adds empirical evidence pertaining to the effectiveness of accounting regulation in aiding investors judgment and decision making.

Finally, this dissertation has implications for emerging research in psychology and management surrounding FoMO. Although the term FoMO was originally associated with the social contexts (Przybylski et al., 2013), concerns about the fear of missing out began to appear more frequently in the investment context (Clor-Proell et al., 2020; Potsaid & Venkataraman, 2022). This dissertation presented one of the earliest tests of the I-FoMO metric. Furthermore, although the popular press attributes the recent surge in retail investor trading to FoMO (Hicks, 2021; Laurent, 2021), limited empirical evidence exists as to whether FoMO affects investor behaviour. As such, this study provides supporting evidence to establish the association between FoMO and investor behaviour, especially in a digital asset environment. Furthermore, although in a social context, several methods have been proposed to mitigate the effects of FoMO (e.g., Santos et al., 2016; Alutaybi et al., 2020), the management literature lacks an empirically supported method for attenuating the effect of FoMO on investors'

judgment and decision making. In this dissertation, I show that presenting investors with disclosures consistent with SAB 121 can act as an effective FoMO reduction tool in an investment setting.

7.4 Limitations and Future Research Opportunities

This research is subject to some limitations that provide several interesting opportunities for future research. From an experimental design perspective, the study utilizes a quasi-experiment given that only one of the independent variables (i.e., the presence/absence of SAB 121) is randomly assigned between subjects.[30] As such, given the nature of quasi-experiments – as compared to pure experiments – there exists some challenges to internal validity. In addition, the study design imposes the investment option to participants. This is a limitation given that in their day to day, investors would be able to select an alternative investment option should they chose to. Future studies could examine investors' investment allocation between different asset classes such as crypto-assets, stocks, and bonds. Furthermore, the study is limited to one type of crypto-asset accounting regulation, namely SAB 121. Future studies could attempt to establish, whether the results obtained extrapolate to other forms of digital asset regulations. Lastly, the valence associated with the information received by investors regarding the crypto-asset market in the experimental material remained constant. This is done to remain consistent with real-world scenarios whereby the media primarily receive positive news from firms (Graham, Harvey, & Rajgopal, 2005; Jung, Naughton, Tahoun, & Wang, 2018; Kothari, Shu, & Wysocki, 2009). However, future studies could examine

[30] Given that I-FoMO is a trait, it is measured and thus not manipulated.

how investor's evaluation of the experimental material would be affected by negative or mixed-valence information.

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Appendices

Appendix A: **Staff Accounting Bulletin No. 121 Guidance**

Staff Accounting Bulletin No. 121

SECURITIES AND EXCHANGE COMMISSION

17 CFR Part 211

[Release No. SAB 121]

Staff Accounting Bulletin No. 121

AGENCY: Securities and Exchange Commission.

ACTION: Publication of Staff Accounting Bulletin.

SUMMARY: This staff accounting bulletin expresses the views of the staff regarding the accounting for obligations to safeguard crypto-assets an entity holds for platform users.

EFFECTIVE DATE: April 11, 2022

FOR FURTHER INFORMATION CONTACT: The Office of the Chief Accountant at (202) 551-5300, or the Division of Corporation Finance's Office of the Chief Accountant, at (202) 551-3400, Securities and Exchange Commission, 100 F Street, NE, Washington, DC 20549.

SUPPLEMENTARY INFORMATION:

The statements in staff accounting bulletins are not rules or interpretations of the Commission, nor are they published as bearing the Commission's official approval. They represent staff interpretations and practices followed by the staff in the Division of Corporation Finance and the Office of the Chief Accountant in administering the disclosure requirements of the federal securities laws.

Dated:

Vanessa Countryman
Secretary

March 31, 2022

PART 211 — [AMENDED]

Accordingly, Part 211 of Title 17 of the Code of Federal Regulations is amended as follows:

PART 211—INTERPRETATIONS RELATING TO FINANCIAL REPORTING MATTERS

1. The authority citation for 17 CFR 211 continues to read as follows: Authority: 15 U.S.C. 77g, 15 U.S.C. 77s(a), 15 U.S.C. 77aa(25) and (26), 15 U.S.C. 78c(b), 15 U.S.C. 78l(b), 15 U.S.C. 78m(b), 15 U.S.C. 80a-8, 15 U.S.C. 80a-29(e), 15 U.S.C. 80a-30, and 15 U.S.C. 80a-37(a).
2. Amend the table in subpart B by adding an entry for Staff Accounting Bulletin No. 121 at the end of the table to read as follows:

Subpart B—Staff Accounting Bulletins

Subject

Release No.

Date

Fed. Reg. Vol. and page

* * * * * * *

Publication of Staff Accounting Bulletin No. 121

SAB121

[INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER]

[INSERT FEDERAL REGISTER CITATION]

Note: The text of Staff Accounting Bulletin No. 121 will not appear in the Code of Federal Regulations.

Staff Accounting Bulletin No. 121

The staff hereby adds Section FF to Topic 5 of the Staff Accounting Bulletin Series. This staff accounting bulletin ("SAB") adds interpretive guidance for entities to consider when they have obligations to safeguard crypto-assets held for their platform users. This SAB is applicable to entities that file reports pursuant to Sections 13(a) or 15(d) of the Securities Exchange Act of 1934 ("Exchange Act") and entities that have submitted or filed a registration statement under the Securities Act of 1933 ("Securities Act") or the Exchange Act that is not yet effective. The SAB is also applicable to entities submitting or filing an offering statement or post-qualification amendment thereto under Regulation A, entities subject to the periodic and the current reporting requirements of Regulation A, and private operating companies whose financial statements are included in filings with the SEC in connection with a business combination involving a shell company, including a special purpose acquisition company. Accordingly, the staff hereby amends the Staff Accounting Bulletin Series as follows:

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TOPIC 5: Miscellaneous Accounting

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The interpretations in this SAB express views of the staff regarding the accounting for entities that have obligations to safeguard crypto-assets held for their platform users.[1] In recent years, the staff has observed an increase in the number of entities that provide platform users with the ability to transact in crypto-assets. In connection with these services, these entities and/or their agents may safeguard the platform user's crypto-asset(s) and also maintain the cryptographic key information necessary to access the crypto-asset. The obligations associated with these arrangements involve unique risks and uncertainties not present in arrangements to safeguard assets that are not crypto-assets, including technological, legal, and regulatory risks and uncertainties. Specifically:

- **Technological risks** – there are risks with respect to both safeguarding of assets and rapidly-changing crypto-assets in the market that are not present with other arrangements to safeguard assets for third parties;
- **Legal risks** – due to the unique characteristics of the assets and the lack of legal precedent, there are significant legal questions surrounding how such arrangements would be treated in a court proceeding arising from an adverse event (e.g., fraud, loss, theft, or bankruptcy); and
- **Regulatory risks** – as compared to many common arrangements to safeguard assets for third parties, there are significantly fewer regulatory requirements for holding crypto-assets for platform users or entities may not be complying with regulatory requirements that do apply, which results in increased risks to investors in these entities.

These risks can have a significant impact on the entity's operations and financial condition. The staff believes that the recognition, measurement, and disclosure guidance in this SAB will enhance the information received by investors and other users of financial statements about these risks, thereby assisting them in making investment and other capital allocation decisions.

FF. Accounting for Obligations to Safeguard Crypto-Assets an Entity Holds for its Platform Users

Facts: Entity A's[2] business includes operating a platform that allows its users to transact in crypto-assets.[3] Entity A also provides a service where it will safeguard the platform users' crypto-assets,[4] including maintaining the cryptographic key information[5] necessary to access the crypto-assets. Entity A also maintains internal recordkeeping of the amount of crypto-assets held for the benefit of each platform user. Entity A secures these crypto-assets and protects them from loss or theft, and any failure to do so exposes Entity A to significant risks, including a risk of financial loss. The platform users have the right to request that Entity A transact in the crypto-asset on the user's behalf (e.g., to sell the crypto-asset and provide the user with the fiat currency (cash) proceeds associated with the sale) or to transfer the crypto-asset to a digital wallet for which Entity A does not maintain the cryptographic key information. However, execution and settlement of transactions involving the platform users' crypto-assets may depend on actions taken by Entity A.

Question 1: How should Entity A account for its obligations to safeguard crypto-assets held for platform users?

Interpretive Response: The ability of Entity A's platform users to obtain future benefits from crypto-assets in digital wallets where Entity A holds the cryptographic key information is dependent on the actions of Entity A to safeguard the assets. Those actions include securing the crypto-assets and the associated cryptographic key information and protecting them from loss, theft, or other misuse. The technological mechanisms supporting how crypto-assets are issued, held, or transferred, as well as legal uncertainties regarding holding crypto-assets for others, create significant increased risks to Entity A, including an increased risk of financial loss.[6] Accordingly, as long as Entity A is responsible for safeguarding the crypto-assets held for its platform users, including maintaining the cryptographic key information necessary to access the crypto-assets, the staff believes that Entity A should present a liability on its balance sheet to reflect its obligation to safeguard the crypto-assets held for its platform users.

As Entity A's loss exposure is based on the significant risks associated with safeguarding the crypto-assets held for its platform users, the staff believes it would be appropriate to measure this safeguarding liability at initial recognition and each reporting date at the fair value[7] of the crypto-assets that Entity A is responsible for holding

for its platform users. The staff also believes it would be appropriate for Entity A to recognize an asset[8] at the same time that it recognizes the safeguarding liability, measured at initial recognition and each reporting date at the fair value of the crypto-assets held for its platform users.[9]

Question 2: Assume the same facts as Question 1. What disclosures would the staff expect Entity A to provide regarding its safeguarding obligations for crypto-assets held for its platform users?

Interpretive Response: In light of the significant risks and uncertainties associated with safeguarding crypto-assets, including the risks of loss associated with holding the cryptographic key information necessary to secure and transact in the crypto-asset, the staff believes the notes to the financial statements should include clear disclosure of the nature and amount of crypto-assets that Entity A is responsible for holding for its platform users, with separate disclosure for each significant crypto-asset, and the vulnerabilities Entity A has due to any concentration in such activities.[10] In addition, because the crypto-asset safeguarding liabilities and the corresponding assets are measured at the fair value of the crypto-assets held for its platform users, the entity would be required to include disclosures regarding fair value measurements.[11] The accounting for the liabilities and corresponding assets should be described in the footnotes to the financial statements.[12] In providing these disclosures, Entity A should consider disclosure about who (e.g., the company, its agent, or another third party) holds the cryptographic key information, maintains the internal recordkeeping of those assets, and is obligated to secure the assets and protect them from loss or theft.

Disclosures regarding the significant risks and uncertainties associated with the entity holding crypto-assets for its platform users may also be required outside the financial statements under existing Commission rules, such as in the description of business, risk factors, or management's discussion and analysis of financial condition and results of operation.[13] For example, to the extent it is material, Entity A may need to provide disclosure describing the types of loss or additional obligations that could occur, including customer or user discontinuation or reduction of use of services, litigation, reputational harm, and regulatory enforcement actions and additional restrictions. A discussion of the analysis of the legal ownership of the crypto-assets held for platform users, including whether they would be available to satisfy general creditor claims in the event of a bankruptcy should be considered. Further, Entity A may need to provide disclosure of the potential impact that the destruction, loss, theft, or compromise or unavailability of the cryptographic key information would have to the ongoing business, financial condition, operating results, and cash flows of the entity. As part of this disclosure, Entity A should also consider including, to the extent material, information about risk-mitigation steps the entity has put in place (e.g., insurance coverage directly related to the crypto-assets held for platform users).

Question 3: How and when should Company A initially apply the guidance in this Topic in its financial statements?

Interpretive Response: The staff would expect an entity that files reports pursuant to Section 13(a) or Section 15(d) of the Exchange Act, or an entity required to file periodic and current reports pursuant to Rule 257(b) of Regulation A, to apply the guidance in Topic 5.FF no later than its financial statements covering the first interim or annual period ending after June 15, 2022, with retrospective application as of the beginning of the fiscal year to which the interim or annual period relates.

The staff expects all other entities, including but not limited to entities conducting an initial registration of securities under the Securities Act or Exchange Act, entities conducting an offering of securities under Regulation A, and private operating companies entering into a business combination transaction with a shell company, including a special purpose acquisition company, to apply the guidance in Topic 5.FF beginning with their next submission or filing with the SEC (e.g., the initial or next amendment of the registration statement, proxy statement, or Form 1-A), with retrospective application, at a minimum, as of the beginning of the most recent annual period ending before June 15, 2022, provided the filing also includes a subsequent interim period that also reflects application of this guidance.[14] If the filing does not include a subsequent interim period that also reflects application of this guidance, then the staff expects it to be applied retrospectively to the beginning of the two most recent annual periods ending before June 15, 2022.

For all entities, in the financial statements that reflect the initial application of this guidance, the effect of the initial application should be reported in the carrying amounts of assets and liabilities as of the beginning of the annual period specified above. Entities should include clear disclosure of the effects of the initial application of this guidance.[15]

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[1] This SAB expresses no view with respect to any other questions that these activities may raise for any of the entities involved, including the applicability of the registration or other provisions of the federal securities laws or any other federal, state, or foreign laws.

[2] References throughout this SAB to "Entity A" are inclusive of the entity as well as any agent acting on its behalf in safeguarding the platform users' crypto-assets.

[3] For purposes of this SAB, the term "crypto-asset" refers to a digital asset that is issued and/or transferred using distributed ledger or blockchain technology using cryptographic techniques.

[4] The service may be provided by Entity A or by an agent acting on Entity A's behalf.

[5] The guidance in this SAB is applicable regardless of whether the cryptographic key remains in the name of the platform user or is in the name of the Entity.

[6] *See generally* Report of the Attorney General's Cyber Digital Task Force: Cryptocurrency Enforcement Framework (Oct. 2020), at 15-16, available at https://www.justice.gov/ag/page/file/1326061/download.

[7] For U.S. generally accepted accounting principles ("U.S. GAAP"), refer to glossary definition provided in Financial Accounting Standards Board ("FASB") Accounting Standards Codification ("ASC") Topic 820. For International Financial Reporting Standards ("IFRS"), refer to glossary definition provided in IFRS 13.

[8] The asset recognized is similar in nature to an indemnification asset as described in FASB ASC 805 and IFRS 3. The measurement of the asset is on the same basis as the crypto-asset safeguarding liability assumed by the entity. The asset recognized by the entity is separate and distinct from the crypto-asset itself that has been transferred to and then held for the platform user.

[9] Similar to the guidance in FASB ASC 805 and IFRS 3, Entity A would need to evaluate whether any potential loss events, such as theft, impact the measurement of the asset.

[10] For U.S. GAAP, *see* FASB ASC 275-10-50. For IFRS, *see* IAS 1.

[11] For U.S. GAAP, *see* FASB ASC 820. For IFRS, *see* IFRS 13.

[12] For U.S. GAAP, *see* FASB ASC 235-10-50. For IFRS, *see* IAS 1.

[13] *See, e.g.*, Item 101 of Regulation S-K; Item 105 of Regulation S-K; Item 303 of Regulation S-K.

[14] For example, a calendar year-end company that submits a registration statement in January 2023 including financial statements as of and for the fiscal year ending December 31, 2021 and as of and for the nine months ended September 30, 2022 would apply the SAB to those periods.

[15] For U.S. GAAP, *see* FASB ASC 250-10-50-1 through 50-3; for IFRS, *see* IAS 8. *See also, e.g.,* Item 302 of Regulation S-K and PCAOB Auditing Standard 2820 (par. 8).

Appendix B: **Research Instrument**

Informed Consent

Study Name: Investment Decision in a Digital Asset (Crypto-Asset) Environment.

Researcher name: Nicolas Epelbaum, PhD Candidate, Department of Accounting, Schulich School of Business – York University; Principal Investigator.

You can contact the Principal Investigator of this study via email at: nepelbaum16@schulich.yorku.ca

Purpose of the Research: The purpose of this study is to increase our understanding of investment decisions in the digital asset (i.e., crypto-asset) space. You are being asked to participate in this study because you are self-identified as an individual familiar with evaluating financial information and/or have experience with assessing financial market performance. Data will be used for the researcher's doctoral dissertation and in associated presentations and publications. No potentially identifying information is expected to be used in either format as all responses will be anonymized prior to data analysis.

What You Will Be Asked to Do in the Research: This study asks you to evaluate financial information and make investment decisions. You will be asked to read a short case and indicate your evaluation of the financial information being presented. There are no right or wrong answers, I am just seeking your honest assessment. In addition, you will also fill out some basic demographic information in order to categorize your responses. Participation in this study will take a total of 10 minutes. You may participate one time.

For agreeing to take part in our research study, and to express our gratitude, you will receive £2.25.

Risks and Discomforts: I do not foresee any risks or discomfort from your participation in the research.

Benefits of the Research and Benefits to You: You may find this study interesting. Additionally, the results of this study will be helpful to accounting researchers, regulators, policy setters and practitioners.

Voluntary Participation and Withdrawal: Your participation in the study is completely voluntary and you may choose to stop participating at any time. Your decision not to volunteer, to stop participating, or to refuse to answer questions will not influence the nature of the ongoing relationship you may have with the researchers or study staff, or the nature of your relationship with York University either now, or in the future.

If you decide to stop participating, you may withdraw without penalty, financial or otherwise, and you will still receive the promised inducement.

In the event you withdraw from the study, all associated data collected will be immediately destroyed wherever possible.

Confidentiality: Confidentiality will be provided to the fullest extent possible by law. Your responses will be completely confidential. The researcher will not have access to any of your identifying information, including your name, and your name will not appear in any report or publication of this research. All data will be electronically collected and stored on a secure computer with restricted, password-protected access. Additionally, only aggregated data will be included in any resulting publication(s) or presentation(s). You will never be identified to York University or any other involved party.

Data will be collected through Qualtrics, an online survey platform, and distributed to the researcher thereafter. The electronic data will be deleted when the data collection round is complete and saved without identifying information as to ensure anonymity. Data will be safely stored on a password protected computer in a locked facility and only research staff will have access to this information.

The data will be stored until December 2025. Following this date, the data will be destroyed by overwriting the drives. The data collected in this research project may be used – in an anonymized form - by members of the research team in subsequent research investigations exploring similar lines of inquiry. Such projects will still undergo ethics review by the HPRC, our institutional REB. Any secondary use of anonymized data by the research team will be treated with the same degree of confidentiality and anonymity as in the original research project.

The researcher(s) acknowledge that the host of the online survey (e.g., Qualtrics, Prolific, etc.) may automatically collect participant data without their knowledge (i.e., IP addresses). Although this information may be provided or made accessible to the researchers, it will not be used or saved without participant's consent on the researchers' system. Further, because this project employs e-based collection techniques, data may be subject to access by third parties because of various security legislation now in place in many countries and thus the confidentiality and privacy of data cannot be guaranteed during web-based transmission.

Questions About the Research? If you have questions about the research in general or about your role in the study, please feel free to contact me at nepelbaum16@schulich.yorku.ca, my doctoral supervisor Dr. Linda Thorne at lthorne@schulich.yorku.ca and/or my graduate program director Dr. Peter Darke at pdarke@schulich.yorku.ca.

This research has received ethics review and approval by the Delegated Ethics Review Committee, which is delegated authority to review research ethics protocols by the

Human Participants Review Sub-Committee, York University's Ethics Review Board, and conforms to the standards of the Canadian Tri-Council Research Ethics guidelines. If you have any questions about this process, or about your rights as a participant in the study, please contact the Director, Research Ethics in the Office of Research Ethics, 3rd Floor, Kaneff Tower, York University (e-mail ore@yorku.ca).

Consent
By selecting "yes" below, you consent to participate in this study.

INSTRUCTIONS

Participation in this study will take a total of 15 minutes.

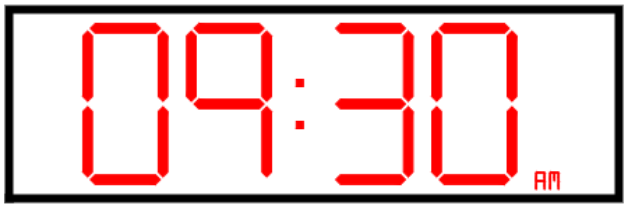
In this study, you will be presented with information related to an investment in a company called Crypto Inc. Please assume you are a potential investor in Crypto Inc. As part of your task, you will be asked to make decisions related to investing in Crypto Inc. There are no right or wrong answers, I am just seeking your honest assessment.

The case information you will receive is not intended to include all the information that would potentially be available if you were making this decision in real life. However, for purposes of this study, base your judgments on the information provided.

For the purposes of this study, please assume that the date on which you are making this decision is January 19, 2023.

A digital clock at the top of each screen will display the time.

BACKGROUND

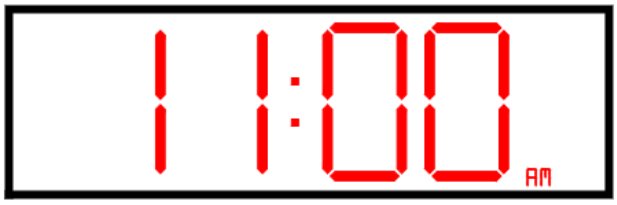


You have done some research into Crypto Inc and are contemplating investing in the company's stock. Like many crypto-asset exchange companies in the recent past, Crypto Inc has seen a recent decline in revenues and performance due to recent macro-economic conditions. In turn, this has caused a decline in the stock price of Crypto Inc. However, several influential investors on various social media platforms have indicated that they now believe the stock to be undervalued. Recent rumors about new and innovative advances in the digital asset space have spurred this speculation among certain investors.

Because of your interest in Crypto Inc, you have setup EZTrade, your online trading platform, to send you periodic alerts related to the stock price of Crypto Inc. Currently, you are set up to receive stock alerts every hour. You check your stock alerts when you have the time.

At the beginning of the day (January 19, 2023), you check EZTrade and see that the price of Crypto Inc stock is $80. Regular trading hours are 9:30 AM to 4:00 PM.

FIRST UPDATE



With five hours left until the close of trading, you receive a stock alert from EZTrade that the price of Crypto Inc stock has increased to $90.

On your Twitter feed, you see a tweet from an investment influencer who is known for picking winning stocks.

Stock Watch
@StockWatch

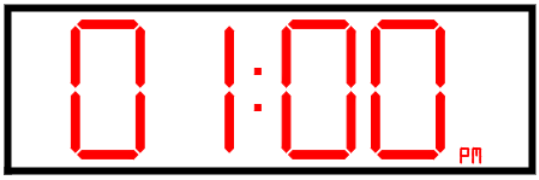
We've been watching movement on @CryptoInc stock closely. Just purchased 10,000 shares at $90...don't miss out on this ride - we expect the price to reach $180 soon! LETS GO!!!!!

Transactions					
Activity Date	Activity	Quantity	Description	Price	Total
01/19/2023	Bought	10,000	Crypto Inc	$90	$900,000

10:53 AM · Jan 19, 2023

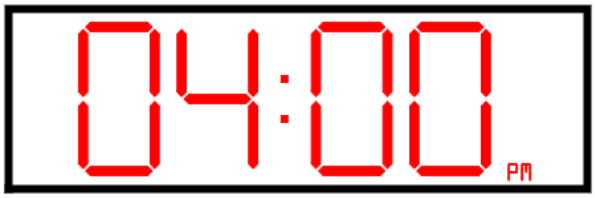
15.2K Retweets **2.1K** Quote Tweets **32.4K** Likes

SECOND UPDATE



You receive a stock alert from EZTrade that the price of Crypto Inc stock has increased to $100. There are three hours left until the close of trading.

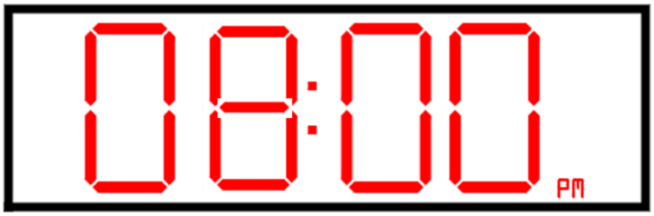
END OF DAY UPDATE



You look for news on Crypto Inc and see the headline: "**Crypto Inc Stock Ends Volatile Trading Day at Higher Price than it Started**"

You check the stock alert from EZTrade and learn that the closing price of Crypto Inc stock is $130 (**$30 higher than the price at which you wanted to place your buy order**).

AFTER HOURS UPDATE



Prior to the opening of the stock market the next day, you note the following statement in Crypto Inc's most recently published annual report following Crypto Inc's adoption of recent accounting guidance issued by the Securities Exchange Commission (SEC) :

"*Because custodially held crypto assets may be considered to be the property of a bankruptcy estate, in the event of a bankruptcy, the crypto assets we hold in custody on behalf of our customers could be subject to bankruptcy proceedings and such customers could be treated as our general unsecured creditors. This may result in customers finding our custodial services more risky and less attractive and any failure to increase our customer base, discontinuation or reduction in use of our platform and products by existing customers as a result could adversely impact our business, operating results, and financial condition.*"

Based on all the information you have read so far, please answer the following questions.

Assume that you have $10,000 USD to invest. How much of these funds will you invest in Crypto Inc?

$0 $10,000

How likely are you to invest in Crypto Inc?

Extremely unlikely | Neither likely nor unlikely | Extremely likely

0 25 50 75 100

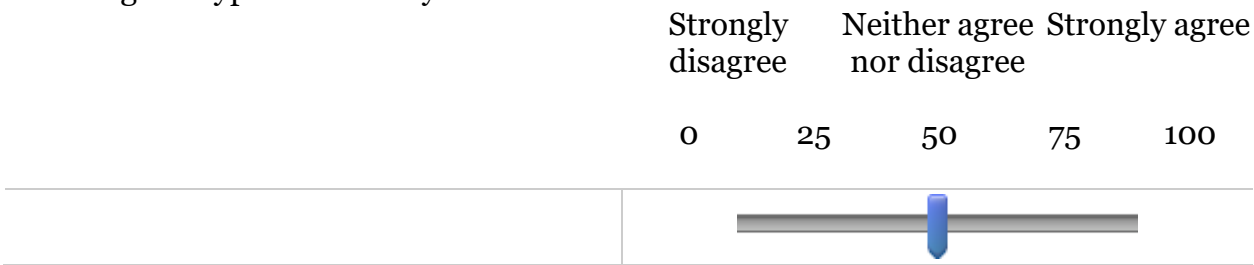
How attractive is an investment in Crypto Inc?

Extremely unattractive | Neither attractive nor unattractive | Extremely attractive

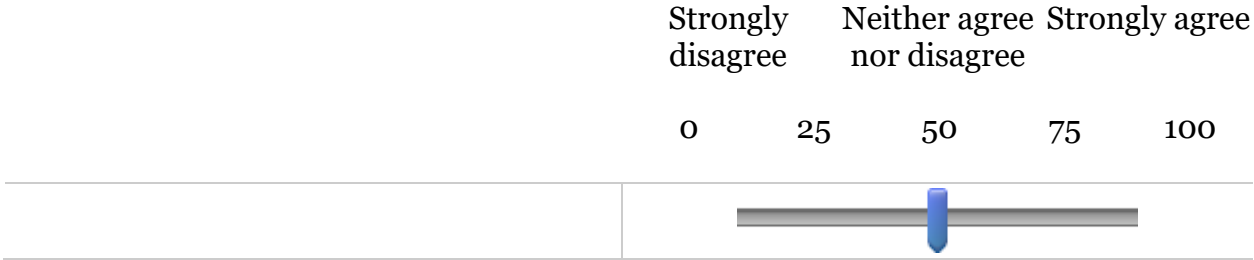
0 25 50 75 100

Please indicate the extent to which you agree with the following statements:

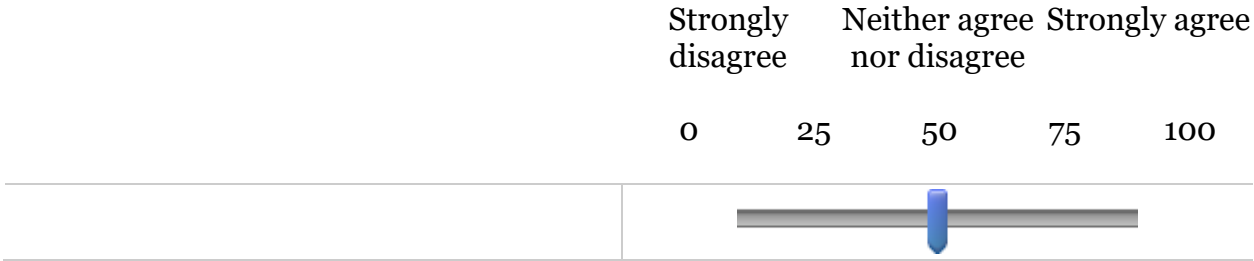
Investing in Crypto Inc is risky.



There is too much uncertainty associated with investing in Crypto Inc.



Compared with other investments, Crypto Inc's stock is riskier.



Based on the information you have read on Crypto Inc, please answer the following question:

In the event of a bankruptcy, how does Crypto Inc treat crypto assets held in custody?

- ○ The crypto assets held in custody on behalf of customers could be subject to bankruptcy proceedings and such customers could be treated as general unsecured creditors.
- ○ No information regarding the treatment of crypto assets held in custody was presented.

To show that you are paying attention, please select "none of the above" option as your answer.

- ○ Strong
- ○ Indifferent
- ○ Weak
- ○ Hostile
- ○ None of the above

You are now done with the case. There are no "correct" or "incorrect" answers to the following questions. The questions are about you. Try to answer these questions as honestly and accurately as possible.

	Not at all true of me	Slightly true of me	Moderately true of me	Very true of me	Extremely true of me
It bothers me when I don't hear news about my investments until the next day.	○	○	○	○	○
I get anxious when I don't know what the companies I'm investing in are planning.	○	○	○	○	○
It is important to me that I am "on top" of the latest news for the companies I'm interested in investing in.	○	○	○	○	○
When I go on vacation, I continue to keep tabs on my investments.	○	○	○	○	○
I feel anxious if I'm "unplugged" from news about my investments.	○	○	○	○	○

I would prefer to be interrupted by breaking news about my investments rather than to receive the information later at a more convenient time.	○	○	○	○	○
I get worried when I am not able to check in on my portfolio.	○	○	○	○	○
I would get anxious if my phone battery ran out when I was expecting news about one of my stocks.	○	○	○	○	○
When I miss out on industry news it bothers me.	○	○	○	○	○
I fear being the last to know about news that is relevant to my portfolio.	○	○	○	○	○

There are no "correct" or "incorrect" answers to the following questions. Try to answer these questions as honestly and accurately as possible.

	Not at all true of me	Slightly true of me	Moderately true of me	Very true of me	Extremely true of me
I fear others have more rewarding experiences than me.	○	○	○	○	○
I fear my friends have more rewarding experiences than me.	○	○	○	○	○
I get worried when I find out my friends are having fun without me.	○	○	○	○	○
I get anxious when I don't know what my friends are up to.	○	○	○	○	○
It is important that I understand my friends "inside jokes".	○	○	○	○	○
Sometimes, I wonder if I spend too much time keeping up with what is going on.	○	○	○	○	○
It bothers me when I	○	○	○	○	○

miss an opportunity to meet up with friends.					
When I have a good time it is important for me to share the details online (e.g. updating status).	○	○	○	○	○
When I miss out on a planned get-together it bothers me.	○	○	○	○	○
When I go on vacation, I continue to keep tabs on what my friends are doing.	○	○	○	○	○

Just a few additional questions about you

How is your English language reading/comprehension ability?

- ○ Poor
- ○ Fair
- ○ Good
- ○ Very Good
- ○ Excellent

When evaluating potential investments, how often do you consult a company's financial information as part of your evaluation?

- ○ Never
- ○ Rarely
- ○ Sometimes
- ○ Most of the time
- ○ Always

What are the main sources of financial information that you use? (Please, select all that apply)

- [ ] Annual Report
- [ ] Real-time market and financial information (e.g., Bloomberg, Dow Jones, S&P Global, Thomson Reuters, Morningstar, IHS Markit and Refinitiv)
- [ ] Social Media
- [ ] Word of mouth
- [ ] Stock market performance
- [ ] Other analyst reports

For how many years have you invested directly in the stock market through a trading platform?

- ○ 1 year or less
- ○ 2 - 4 years
- ○ 5 - 7 years
- ○ 7 - 9 years
- ○ 10 years or more

What is your highest level of education? (Please check one)

- ○ Less than high school
- ○ High school graduate
- ○ Some college
- ○ 2 year degree
- ○ 4 year degree
- ○ Professional degree
- ○ Doctorate

How many college level accounting courses have you completed?

- ○ None
- ○ 1 - 4
- ○ 5 - 8
- ○ 9 - 12
- ○ More than 12

How many college level finance courses have you completed?

- ○ None
- ○ 1 - 4
- ○ 5 - 8
- ○ 9 - 12
- ○ More than 12

What is your current job title?

_____

How many years of full-time work experience do you have?

- ○ None
- ○ 1 - 4
- ○ 5 - 8
- ○ 9 - 12
- ○ More than 12

Please indicate your gender:

- ○ Male
- ○ Female
- ○ Non-binary / third gender
- ○ Prefer not to say

What is your age?

0 100

Do you have any additional comments for the researchers?

_____
_____
_____
_____
_____