The role of trust and risk-perception for cryptocurrency adoption: Evidence from three Nordic countries

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ABSTRACT

The growth and size of the cryptocurrency market is combined with limited knowledge about what drives individual investment motivation. In response, our study explores the influence of four different trust measures on investor risk perception of and participation in cryptocurrencies. We conduct our study among 1,519 individual investors in three Nordic countries, Denmark, Finland and Sweden, countries characterised by high trust and investment participation among its populations. We find that cryptocurrency knowledge and trust in strangers in relation to financial matters reduce the perceived riskiness of cryptocurrencies. Furthermore, relative to their less trusting peers, trusting individuals are more prevalent market participants, both in terms of current crypto holdings and the intention to make future investments. Our study contributes to the small but growing literature about cryptocurrency investing and to the stream of literature that documents the relationship between trust and market participation. The research discussed here is relevant for actors in the cryptocurrency market including developers, service providers, investors, and financial market regulators.

Keywords: cryptocurrency; investment decision making; trust; risk taking; gender
JEL Classifications: G11; G51; G53; D81

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1 Introduction

It is widely accepted that investor trust is an important determinant of financial behaviour. Individual trust positively influences stock market participation (Guiso, Sapienza and Zingales, 2008), equity share (Balloch, Nicolae and Philip, 2015) and reduces investor sensitivity to investment risk and fees (Gennaioli, Shleifer and Vishny, 2015). Trust plays a critical role in the financial intermediation industry as well, as evidenced by lower withdrawals from financial advisors, following the Madoff Ponzi scheme (Gurun, Stoffman and Yonker, 2017). On the contrary, distrust in financial markets and among market participants is negatively linked to stock market participation (Choi and Robertson, 2021). Participants in lower trust settings tend to view financial advising as a particularly untrustworthy profession (Egan, Matvos, Seru, 2019). Individuals frequently feel anxious about making investment decisions (Loewenstein et al. 2001), and refrain from investing altogether (Bilias, Georgarakos, and Haliassos 2010), attitudes that have been linked to events such as the credit crisis, that damages consumer confidence (Balloch, Nicolae and Philip, 2015). Similarly, societal trust has been linked to investment decisions whereby residents in high trust societies, e.g., Sweden, Denmark, and Switzerland have higher stock market participation rates compared to low trust populations (Georgarakos and Pasini, 2011).

Cryptocurrencies represent a dynamic and rapidly evolving contemporary financial ecosystem that has experienced substantial growth since the launch of Bitcoin in 2009. As digital (blockchain) assets, cryptocurrencies attract significant attention from investors, governments, and businesses worldwide. With a total market capitalization exceeding $1.7T in 2024, there are over 2 million different types of cryptocurrencies in existence,[1] with few major players dominating the market, e.g., Bitcoin (BTC), Ethereum (ETH), Tether (USDT), Binance Coin (BNB), Solana

[1] coinmarketcap.com

(SOL). Bitcoin, the first market entrant, remains the most well-known cryptocurrency to represent a substantial portion, more than $900B, of the total crypto market capitalization[2]. Ethereum, which serves as the leading platform for smart contracts and decentralized applications (dApps), has also gained a substantial market share of$290B)[3].

The size, unprecedented growth and rising integration of the cryptocurrency market into mainstream financial markets motivate the need to increase our understanding of individual investor behaviour and motivation in relation to investor participation in crypto assets, known for their high levels of volatility. A growing body of research has established the importance of various types of trust - individual trust (Balloch, Nicolae and Philip, 2015), generalized trust in society (Georgarakos and Pasini, 2011) and trust in financial intermediaries (Kaustia, Conlin and Luotonen, 2023) in fostering stock market participation. However, less is known about trust and investment in the alternative asset class, cryptocurrency. This is an interesting subject to investigate given the fact that the relationship between trust and the adoption of cryptocurrencies is not *a priori* clear. While the foolproof nature of blockchain technology on which most cryptocurrencies are built may mitigate the need for trust, the fact that cryptocurrency users remain anonymous to each other, except for their wallet addresses, may heighten trust concerns.

This backdrop, coupled with prior evidence that investment participation is in part predicated on trust, seems to suggest that individual trust may be important for people's intentions to hold cryptocurrency. We address this in our study which aims to deepen our knowledge about the role of trust in cryptocurrency participation. We make a specific contribution to research that investigate links between distrust in the general currency markets and crypto participation (Auer and Tercero-Lucas, 2022) and that which explores the effect of interpersonal trust on the interest

[2] https://coinmarketcap.com/currencies/bitcoin/
[3] https://coinmarketcap.com/currencies/ethereum/

in and adoption of cryptocurrencies (Jalan et al., 2023). Jalan et al. (2023), using the World Value Survey trust measure, show that interpersonal trust fosters interest in and adoption of cryptocurrency assets, documenting a positive relationship between societal trust and cryptocurrency interest and adoption using tweets and Google Trends as proxies. In this paper, we build on and extend the findings of Jalan et al. (2023) by using different aspects of trust that potentially influence investor perception and consequently investor participation in cryptocurrency assets in three Nordic countries.

We conduct our investigation using a custom-designed survey administered in December 2022, comprising 1,519 individual investors from Denmark (N=500), Finland (N=518) and Sweden (N=501). Our choice of geography is motivated by the unique setting in these countries, characterised by high levels of digital innovation, high interpersonal trust and high stock market participation, of up to 37.6% (Kaustia, Conlin and Luotonen, 2023).[4] Sweden serves as a perfect example of institutional reliance on digitalization through the use of BankID, a e-personal identification system used by 99.2% of the population.[5] Managed by large Swedish banks, BankID facilitates the use of Swish, an online electronic payment system.[6] With 92% of transactions using electronic methods, Sweden is estimated to be a cashless society by 2030 (Statista, 2023). Our design allows us to consider several individual trust measures, i.e., trust in strangers relating to general and financial matters as well as their confidence in government and financial institutions. We also enquire about cryptocurrency knowledge and risk tolerance.

First, our results show that individuals with higher cryptocurrency knowledge have higher risk tolerance on average. This aligns with findings by Bellofatto et al. (2018) and Bianchi (2018),

[4] Kaustia, Conlin and Luotonen (2023) show that Denmark and Sweden are in the top tercile among European countries with stock market participation rates of 37.6%, compared to mid tercile (25.7%) and bottom tercile (10%).
[5] https://www.bankid.com/en
[6] https://www.swish.nu/

who underscore the importance of financial literacy to withstand risk as well as Klapper and Lusardi (2020) and Calcagno and Monticone (2015) who highlight the role of knowledge for understanding investment options. Our study contributes to this body of research by showing that educating individuals about cryptocurrencies could increase investment participation through better risk tolerance.

Second, while our aggregate trust measure does not influence cryptocurrency ownership, our study reveals decomposed effects when trust is broken into components. Trust in financial matters influence both current and future cryptocurrency investment participation positively, whereas confidence in government influences future participation negatively. Our finding that trust in financial matters fosters investment participation confirms the findings of Kaustia, Conlin and Luotonen (2023) in relation to trusting financial intermediation and stock market participation. Our results therefore contribute to the literature that correlate trust and traditional stock market participation, e.g., Guiso, Sapienza, and Zingales (2008), and Balloch, Nicolae, and Philip (2015), extending it to the cryptocurrency domain. Despite the anonymous nature of blockchain, trust has a positive influence on innovation adoption and financial market development (e.g. Kirs and Bagchi, 2012; Alalwan et al. 2018; Guiso et al., 2004; Guiso, Sapienza and Zingales, 2008).

Our third contribution lies in showing a nuanced influence of trust on perceived cryptocurrency risk. Overall, our four trust measures have a diluted influence on overall perceived riskiness, but they significantly reduce the perception of risk when focusing specifically on cryptocurrency. This finding is in line with research by Georgarakos and Pasini (2011), and Kaustia, Conlin, and Luotonen (2023) in their connections with stock market participation. Our study, however, indicates that the role of trust for risk perception in the cryptocurrency market differs from that in traditional financial markets.

Our findings bear relevance to those engaged in developing alternative assets and in that process seek to attract individual investors. Furthermore, customer insight is important for financial market regulators as they consider potential regulation of the marketplace for cryptocurrencies.

2 Theoretical Framework and Hypotheses Development

2.1 Cryptocurrency investing

The growing market for cryptocurrencies possesses the necessary infrastructure to facilitate trading and settlement. Cryptocurrencies are traded on centralized and decentralized exchanges, wallets, DeFi platforms, payment processors which operate as an independent ecosystem, alongside traditional financial systems. Examples of exchanges that facilitate trading of cryptocurrencies are Binance, Coinbase, and Kraken. Wallets, both hardware and software, enable investors to securely store and manage their digital holdings. Payment processors, like BitPay[7] or Coinbase Commerce[8] allow merchants to accept cryptocurrencies for goods and services.

The cryptocurrency market includes diverse participants, including retail investors, institutional investors, miners, developers and businesses. In recent years, institutional involvement in the cryptocurrency market has increased, with several big-cap companies and investment funds widening their portfolios to include digital assets. Inspired by the foolproofness of blockchain technology, central banks in some countries are evaluating the launch of digital currencies, providing an additional layer of legitimacy and mainstream integration to crypto assets.

The regulatory landscape for cryptocurrencies varies significantly across jurisdictions. Uninhibited government support for digital assets can be observed in some countries with outright

[7] https://bitpay.com/
[8] https://www.coinbase.com/commerce

restrictions or bans in others. In an attempt to increase transparency and security, several cryptocurrency trading platforms impose anti-money laundering (AML) and know-your-customer (KYC) requirements[9].

A defining characteristic of the cryptocurrency market is its high price volatility. Frequently associated with the nonexistence of intrinsic value, crypto asset price fluctuations are driven by a combination of factors such as market sentiment, regulatory changes, technological advancements, and macroeconomic events. These present both opportunities and risks for investors who may end up with windfall gains or lose all their capital. With an absence of a coherent regulatory framework, investors are forced to make perceptual judgements about the inherent risk of engaging in cryptocurrency investing that in turn guides their investing.

2.2 Investor knowledge and risk tolerance

Investment knowledge underpins an investor's ability to understand and evaluate different investment options. Financial illiteracy is a widespread phenomenon that contributes to the global wealth and financial participation gap (Klapper and Lusardi, 2020). Linked to investment indecision and inertia (Calcagno and Monticone, 2015), inadequate knowledge can result in lower adjusted returns (Gaudecker, 2015). Contrarily, highly financially literate individuals invest more and make better investment decisions with higher risk adjusted returns compared to their less knowledgeable peers (Bellofatto, D'Hondt, De Winne and Bellagatto, 2018). While financial knowledge contributes to the acceptance of investment risk (Bianchi, 2018), knowledge generated from prior investment experiences significantly explains some of the widely documented gender differences in investment risk tolerance (Brooks, Sangiorgi, Hillenbrand and Money, 2019). As such, investment knowledge is an important determinant in financial investing and acceptance of investment risk.

[9] https://onfido.com/blog/which-crypto-exchanges-use-kyc/

Investment risk tolerance predetermines people's capacity to withstand the risk and return variability in their investment portfolios with highly risk tolerant individuals investing significantly more compared to risk averse investors (Bellofatto, D'Hondt, De Winne and Bellagatto, 2018). Furthermore, risk tolerant individuals have a greater tendency to trade more frequently, invest in sophisticated and higher risk assets compared to more conservative investors (Hoffmann, Post and Pennings, 2015). In a study across 19 European nations, Kaustia, Conlin and Luotonen (2023) identify how people's risk-taking attitudes trump their numerical ability for determining stock market participation.

In a nutshell, current research documents that investment participation is directly influenced by investors' ability to tolerate investment risk, which in turn is founded on investment knowledge and prior investment experience.

We therefore hypothesise that:

H1: Cryptocurrency knowledge is likely to contribute to higher risk tolerance.

2.3 Trust and investor participation

It is widely accepted that investor trust is an important determinant of financial behaviour. While investment decisions are informed by individuals' risk and return evaluation, they are also influenced by the trust individuals place in for example, financial information, financial intermediation or in the financial system as a whole (Guiso, Sapienza and Zingales, 2008). While financial knowledge can assist traders in making rational risk assessments, trust can help them ameliorate debilitating feelings of anxiety (Loewenstein et al. 2001) – feelings that can prevent people from investing altogether (Bilias, Georgarakos and Haliassos 2010). Trust is particularly important in the financial system, whose reputation is fragile and has suffered greatly from events that have significantly damaged consumer confidence, such as the credit crisis (Balloch, Nicolae

and Philip, 2015). Regulators have attempted to restore consumer trust through the introduction of measures including enhanced stability measures, product disclosures and customer protection (Bouvard, Chaigneau and Motta, 2015). Using a variety of trust measures, researchers confirm that highly trusting individuals are more likely to participate in the stock market while those who distrust financial markets and market participants are more avoidant (Choi and Robertson, 2021).

Using the World Values Survey which investigates participants' agreement with whether most people can be trusted in general, Guiso, Sapienza and Zingales (2008) associate high trust levels among the Dutch population (N=1,943) with higher stock holdings and larger allocations of wealth to investments ('equity share') among individuals. Interestingly, these results hold even when controlling for risk aversion. Using a sample of over 6,000 people in the US and their trust in the stock market, stockbrokers and investment advisors, Balloch, Nicolae and Philip (2015) find that high trust contributes to increased equity shares. These results are corroborated by Choi and Robertson (2021) in their investigation of 1,013 US participants in the RAND American Life Panel ('ALP'). Modelling investors' trust in their financial advisors and managers, Gennaioli, Shleifer and Vishny (2015) find that investors who trust their managers are less sensitive to investment risk and management fees. Using data on generalised trust in others from the Survey on Health, Ageing and Retirement in Europe and the World Values Survey (SHARE), Georgarakos and Pasini (2011) link societal trust to investment decisions and find that investors in high trust societies, e.g., Sweden, Denmark, and Switzerland have higher stock market participation rates compared to those in low trust populations. Drawing on SHARE data from 20 European countries, Kaustia, Conlin and Luotonen (2023), find that trust in financial advisors and intermediaries is critical in fostering stock market participation.

Current literature therefore agrees that stock market participation is predicated on various types of trust, e.g., individual trust (Balloch, Nicolae and Philip, 2015), generalized trust in society

(Georgarakos and Pasini, 2011) or confidence in financial intermediaries (Kaustia, Conlin and Luotonen, 2023), with more trusting individuals more likely to participate and have larger equity holdings compared to less trusting people. However, less is known about trust and investment in the alternative asset class, cryptocurrency. Nonetheless, extant literature enables us to hypothesise that:

H2: High trust individuals are more likely to participate in cryptocurrency investing than less trusting individuals.

H3: Trust is likely to have a positive effect on the perceived riskiness of cryptocurrency investment.

3. Data and methodology

3.1. Survey description and the main variables of interest

The survey was conducted from 8/11/2022 to 7/12/2022. The final respondent count per country (after rigorous quality check) stands at 500 in Denmark, 518 in Finland, and 501 in Sweden. Weights are assigned based on age, gender, and education using census data to ensure representativeness[10]. The sample was randomly selected, and the results represent the online population of the respective countries[11].

Our main variables come from responses to questions posed to respondents in our questionnaire (see Table 1). For comprehensiveness in our empirical tests, we cover questions in various aspects of respondents' socio-demographic profile, saving preferences, crypto attitudes and knowledge, risk perceptions and trust attitudes. Our questions for each of these aspects come from generally different sources. The socio-demographic questions concerning gender, age, education, annual income, marital status etc. have been sourced from the World Value Survey.

[10] This phase was accomplished with the help from GWI (www.gwi.com).
[11] The private agency's panel partners have long established communities of respondents that they reached out to on our behalf. These communities are maintained to ensure representativeness at the local level, and therefore approximately matching the sample matching population ratios well.

Similarly, questions covering various aspects of trust/ confidence – interpersonal, institutional, political etc. comes from the WVS. Not only is the WVS measure of trust widely used in literature (e.g., Jen et al., 2010; Delhey et al., 2011, among others), the correlation between the WVS trust responses and experimentally measured trust is also well documented (Johnson and Mislin, 2012). Questions to test objective knowledge, familiarity and perceived risk in cryptos were designed by the authors, based on similar surveys in crypto assets and financial literacy (see for instance, the OECD Consumer Insights Survey on Cryptoassets[12], the OECD/ INF Toolkit for measuring financial literacy and financial inclusion, 2022[13]).

[12] https://www.oecd.org/financial/education/consumer-insights-survey-on-cryptoassets.pdf
[13] https://www.oecd.org/financial/education/2022-INFE-Toolkit-Measuring-Finlit-Financial-Inclusion.pdf

Table 1. Key variable definitions

Name	Survey question	Answer options
Main variables of interest		
Current crypto ownership (q10_5)	Answer to the questions: What kind of savings/investments do you have?	Crypto assets / NFTs = 0 or 1
Knowledge (q20)	Which of the following are considered to be cryptos/tokens? (The knowledge variable is assigned 1 if a respondent provided a correct answer, and 0 otherwise)	1. BTC, ETH, LTC, UNI, BYND, WMT, AAPL 2. SNP, AMZN, PTR, AAPL, 3MSFT, 3. AAVE, USDP, AMZN 4. BTC, ETH, ICP, WBTC, LEO, CRO, XLM, 5. I don't know
Familiarity (self-perception familiarity) q21	How familiar are you with the following crypto currencies? (Average across 25 cryptocurrencies)	1. Not familiar at all … 5. Extremely familiar
Self-perception of understanding of cryptos (q23_2)	Please indicate if you agree or disagree with the following statements about cryptocurrency: I have a strong understanding of cryptocurrencies	1. Strongly disagree … 5. Strongly Agree 6. Not applicable / Don't know
Trust / confidence (q48_1-q48_5	How much do you agree with the following statements? I would trust a stranger in general matters I would trust a stranger in matters of financial advice I feel confident in the government that runs my country I feel confident in the financial institutions in my country	1. Strongly disagree … 5 Strongly Agree
Risk perception (q39_3, q39_6, q39_5, q39_7, q39_8)	Please indicate if you agree or disagree with the following statements about cryptocurrency on a scale of 1 to 10, where 1 stands for 'completely disagree' and 10 for 'completely agree': I consider cryptocurrency to be a risk Cryptocurrency exchanges are vulnerable to cyber attacks Cryptocurrencies are unregulated The legal status of cryptocurrency is always uncertain The price of cryptocurrencies is highly volatile	1. Completely disagree …10. Completely Agree 0. I don't know
Crypto Opportunity	I consider cryptocurrency to be an opportunity	1. Completely disagree …10. Completely Agree 0. I don't know
Risk tolerance (q37)	How much of your total cryptocurrency investment are you/were you willing to lose? Please select the option that most applies	1. None, 2. Up to 5%, 3. Up to 10%, 4. Up to 15% 5. Up to 30%, 6. Up to 50%, 7. Other; please specify
Past experience (q32)	Since you started investing, have you gained or made a loss on your crypto investments? Please select the option that most applies	1. Gained, 2. Lost, -1. Prefer not to say
Future crypto holding (q39_1)	Please indicate if you agree or disagree with the following statements about cryptocurrency on a scale of 1 to 10, where 1 stands for 'completely disagree' and 10 for 'completely agree': I would like to hold cryptocurrency in the future	1. Completely disagree … 10. Completely Agree 0. - I don't know

Control variables		
Gender (q2)	Which of the following best describes your gender?	1. Male 2. Female
Ln(age), q3	How old are you?	16 years…64 years
Same country stay (q4)	How many years have you lived in your current country of residence?	1. Since birth, 2. 1-2 years, 3. 2-3 years. 4. 3-4 years, 5. 4-5 years. 6. 5+ years
Marital Status (q5)	What best describes your marital status?	1. Single, 2. In a relationship, 3. Married, 4. Divorced/separated, 5. Other
Education (q7)	What best describes the highest level of education you have achieved?	1. No formal education, 2. Primary/ Elementary education 3. Secondary School/ High School, 4. Undergraduate degree 5. University Postgraduate (Master) 6. University Postgraduate (PhD), 7. Other; please specify
Home ownership (q8)	What best describes your current housing situation?	1. I personally own my house/apartment, 2. I rent my house/apartment, 3. I do not rent nor own my own house/apartment
Debt (q9)	If any, what is the value of the current financial products that you currently have? By value we mean the amount you are still needing to pay back. It is an average across three types of debt: Personal Loan, Credit cards, Business loan	1. None currently, 2. Less than EUR2,000, 3. EUR2001-EUR3,000 4. EUR3,001-EUR4,000. 5. EUR4,001-EUR5,000 6. EUR5,001-EUR6,000, 7. EUR6,001-EUR7,000 8. EUR7,001-EUR8,000, 9. EUR8,001-EUR9,000, 10. More than EUR10,000
Savings (q11)	What is the total value of your current savings?	1. Less than EUR1,500, 2. EUR1,501-EUR2,500, 3. EUR2,501-EUR3,500 4. EUR3,501-EUR4,500, 5. EUR4,501-EUR5,500 6. EUR5,501-EUR6,500, 7. EUR6,501-EUR7,500 8. EUR7,501-EUR8,500, 9. EUR8,501-EUR9,500 10. EUR9,501-EUR10,000, 11. More than EUR10,000, 12. Prefer not to say
Employment (q14)	What is your current working status? Please select the option that most applies	1. Full-time worker, 2. Part-time worker, 3. Self-employed/ Freelancer 4. Full-time parent/ stay-at-home parent, 5. Student, 6. Unemployed 7. Retired, 8. Other
Total annual income (q16)	What is your annual household income before tax or any other deductions?	0. No income, 1. EUR20,000 or less, 2. EUR20,001 to EUR30,000 3. EUR30,001 to EUR50,000, 4. EUR50,001 to EUR60,000 5. EUR60,001 to EUR75,000, 6. EUR75,001 to EUR100,000 7. EUR100,001 or more, 8. Don't know, 9. Prefer not to say

Notes: The table includes the questions used in the survey, their descriptions and ways of measurement. The questions are a mix of binary choices, multiple-choice, and Likert scale ratings. The 25 cryptocurrencies used in the survey are: (Bitcoin (BTC), Ethereum (ETH), Tether (USDT), Binance Coin (BNB), U. S. Dollar Coin (USDC), XRP (XRP), Cardano (ADA), Solana (SOL), Polkadot (DOT), Dogecoin (DOGE), Stellar (XLM), Neo, Celsius (CEL), Nano, Dash (DASH), TRON (TRX), Zcash (ZEC), NEM (XEM), Bitcoin SV (BSV), EOS Coin (EOS),VeChain (VET), Dai (DAI), Avalanche (AVAX), Cosmos (ATOM), Filecoin (FIL).

Our dependent variable uses the response to the question: "*What kind of savings/investments do you have?*" (Table 2). In particular, we focus on the answers related to option 5: crypto assets/NFTs (the answers are binary – "0" represents no crypto/NFTs, while "1" represents yes).

Table 2. Types of saving/investment (q10)

	Total	**By Country**			**By Gender**	
Asset		**Denmark**	**Finland**	**Sweden**	**Male**	**Female**
1. Pensions	29.23%	47.4%	8.30%	32.73%	32.25%	26.81%
2. Real estate/property (other than the house you live in)	12.90%	18%	10.04%	10.78%	14.79%	11.39%
3. Savings in the bank	47.07%	54.4%	45.95%	40.92%	44.38%	49.23%
4. Stocks/shares	29.43%	30.6%	26.06%	31.74%	37.87%	22.66%
5. Crypto assets / NFTs	11.06%	12.6%	9.46%	11.18%	18.34%	5.22%
6. Antiques / art	6.78%	8.2%	5.79%	6.39%	9.32%	4.74%
7. Bonds	5.66%	11.4%	2.32%	3.39%	7.84%	3.91%
8. Mutual funds	29.95%	18.4%	29.92%	41.52%	34.02%	26.69%
9. ESG products	3.95%	4.4%	0.97%	6.59%	5.92%	2.37%
10. Other	1.18%	0.4%	1.74%	1.40%	1.48%	0.95%
11. Prefer not to say	4.54%	3.6%	3.47%	6.59%	4.44%	4.63%
12. Don't have any	19.42%	12.4%	27.99%	17.56%	14.35%	23.49%

Notes: The table presents the selection of the types of investments included in the survey.

Table 2 indicates that the ownership rate of crypto assets/NFTs is around 11.06%, placing it in the middle range compared to other assets. To assess respondents' objective knowledge about cryptocurrencies, we asked them the following question: "*Which of the following are considered to be cryptos/tokens?*" The results are presented in Table 3.

Table 3. Objective knowledge in cryptos: Which of the following are considered to be cryptos/tokens?

	Respondent Gender	
Answer options	**Male (%)**	**Female (%)**
(1) Btc, eth, ltc, uni, bynd, wmt, aapl	28.55%	11.15%
(2) Snp, amzn, ptr, aapl, 3msft	4.44%	1.66%
(3) Aave, usdp, amzn	1.78%	1.54%
(4)Btc, eth, icp, wbtc, leo, cro, xlm	23.52%	7.47%
(5) I don't know	41.72%	78.17%

Table 3 indicates that only 23.5% of male respondents and 7.5% of female respondents were able to correctly identify which cryptocurrencies/tokens were being referred to (the correct option being number 4), with more than half the respondents providing an incorrect answer or admitting the fact that they did not know the answer. The highest percentage of correct answers was observed in Sweden at 27.2%, while in Denmark and Finland, these numbers were 22.8% and 26.2% respectively.

Table 4. Cryptocurrency gains/losses

	Total	**By Gender**		**By Country**		
Type		Male	Female	Denmark	Sweden	Finland
Gained	12.6%	19.9%	5.0%	13.9%	14.9%	6.7%
Lost	4.6%	6.4%	2.7%	5.5%	4.2%	4.2%
Prefer not to say	1.1%	1.2%	1.1%	1.6%	1.2%	0.4%

In terms of experience, the results (Table 4) show that males in Sweden and Denmark report having experienced the highest gains and losses from prior crypto investments while females in Finland and Sweden report the lowest gains and losses. Despite observed inter-country fluctuations in gender dynamics of cryptocurrency investments, we remark that on an overall basis,

males report higher prior gains compared to females, while losses remain relatively evenly distributed.

3.2. Descriptive statistics and correlations

Risk perception in our study includes several dimensions:

(q39_3) – I consider cryptocurrency to be a risk,

(q39_6) - Cryptocurrency exchanges are vulnerable to cyber-attacks,

(q39_5) - Cryptocurrencies are unregulated,

(q39_7) - The legal status of cryptocurrency is always uncertain,

(q39_8) - The price of cryptocurrencies is highly volatile.

Responses to each risk statement can vary from 0 to 10, where 0 - I don't know, 1- Completely disagree,…, 10 - Completely Agree.

The general statistics are presented below:

Table 5. General statistics: Risk perception questions

	q39_3	q39_5	q39_6	q39_7	q39_8
Min.	0.00	0.00	0.00	0.00	0.00
Quartile1	4.00	0.00	0.00	0.00	0.00
Median	7.00	5.00	5.00	6.00	6.00
Mean	6.38	4.52	4.85	4.99	5.16
Quartile3	10.00	8.00	8.00	8.00	9.00
Max.	10.00	10.00	10.00	10.00	10.00

Table 5 shows the existence of a pervasive perception of riskiness associated with cryptocurrencies, as can be seen in the high median and mean values. A notable portion of respondents 'strongly agree' with statement q39_3 (general risk). For other risk questions too, the results show a moderate to high level of concern about various aspects of cryptocurrencies, such

as vulnerability to cyber-attacks, lack of regulation, uncertain legal status, and price volatility. The fact that the first quartile for these responses is 0 suggests a polarized view: a significant number of respondents either have no opinion on the matter, or disagree, or express strong concerns with respect to these specific risks.

Table 6. Correlation among the risk perception statement responses

	q39_3	q39_6	q39_5	q39_7	q39_8
q39_3	1.00	0.52	0.45	0.55	0.50
q39_6	0.52	1.00	0.57	0.57	0.51
q39_5	0.45	0.57	1.00	0.62	0.61
q39_7	0.55	0.57	0.62	1.00	0.56
q39_8	0.50	0.51	0.61	0.56	1.00

Table 6 shows a consistent pattern of correlated concerns among respondents. Those who are concerned about one aspect of cryptocurrency risks (such as legality, regulation, or vulnerability to cyber-attacks, etc.) also tend to be concerned about other aspects. Given this high correlation, we create a new variable *overall_risk_perception,* a simple average of responses to the five risk-related questions. This captures overall risk perception of cryptos and will serve as our dependent variable in testing H1.

Our survey includes three questions to test respondent knowledge of crypto assets: While questions q21 and q23_2 test self-perceived familiarity and understanding of cryptos respectively, question q20 tests objective understanding of cryptos with only one correct answer possible. We create a new variable "*crypto_knowledge*" that combines these three responses. Given that these three variables represent different categories or types of responses, we apply the z-score for standardization. For binary variables, such as those indicating correctness or otherwise of objective crypto understanding (q20), converting to z-scores means looking at how far each observation is from the mean in terms of standard deviations. Since binary variables can take only one of two values, the resulting z-scores do not have the spectrum typically observed with continuous

variables. However, we find that they still indicate the relative positioning of each value. We do acknowledge that compared to the original 0-1 scale, these may seem less intuitive. For all three variables, after conversion, the meaning of the 'distance' from the mean is not as clear as it is with continuous variables.

To proxy for trust and confidence, we use responses to the following questions: "*I would trust a stranger in general matters*", and "*I would trust a stranger in matters of financial advice*", "*I feel confident in the government that runs my country*" and "*I feel confident in the financial institutions in my country*". We also create two variables *aggregate_trust* and *aggregate_confidence*, that represent simple averages of responses to two questions each: "I would trust a stranger in general matters" and "I would trust a stranger in matters of financial advice", for trust, and "I feel confident in the government that runs my country" and "I feel confident in the financial institutions in my country", for confidence. The general statistics are presented in Table 7.

Table 7. General statistics of the final variables used

Variable	Whole sample						Current crypto owners vs non-owners				Males vs females			
	mean	std dev	median	max	min	skewness	mean non crypto owners	mean crypto owners	t-statistic (means difference)	p-value (means difference)	mean males	mean females	t-statistic (means difference)	p-value (means difference)
Crypto Risk Tolerance	0.775	1.675	0.000	7.0	0.0	2.061	0.439	3.476	18.207	0.000	1.251	0.393	9.779	0.000
Past Experience	0.175	0.501	0.000	2.0	-1.0	2.339	0.082	0.923	13.891	0.000	0.281	0.090	7.207	0.000
Crypto Ownership	0.111	0.314	0.000	1.0	0.0	2.481	0.000	1.000	--	--	0.183	0.052	7.834	0.000
Future Holding intention	3.735	3.258	3.000	10.0	0.0	0.494	3.277	7.417	18.646	0.000	4.441	3.168	7.612	0.000
Knowledge (test)	0.228	0.420	0.000	1.0	0.0	1.292	0.182	0.601	10.659	0.000	0.362	0.121	11.152	0.000
Familiarity	1.503	0.792	1.120	5.0	1.0	1.993	1.373	2.548	16.142	0.000	1.752	1.303	10.914	0.000
Self-perception of understanding of cryptos	2.365	1.585	2.000	6.0	1.0	0.978	2.237	3.393	10.933	0.000	2.583	2.190	4.906	0.000
Overall risk perception (accounting all risks)	5.178	2.984	5.800	10.0	0.0	-0.363	4.959	6.939	11.260	0.000	6.118	4.424	11.568	0.000
Overall crypto knowledge (knowledge, familiarity and self-perception)	0.000	0.746	-0.284	2.6	-0.7	1.074	-0.12	0.952	18.721	0.000	0.257	-0.21	12.264	0.000
Aggregate trust (average of two trust questions)	2.390	0.970	2.500	5.0	1.0	0.127	2.338	2.810	5.842	0.000	2.466	2.329	2.736	0.006
Aggregate confidence (average of two confidence questions)	2.953	1.001	3.000	5.0	1.0	-0.175	2.934	3.101	2.077	0.039	2.980	2.931	0.943	0.346
Trust in general matters	2.460	1.103	3.000	5.0	1.0	0.154	2.417	2.798	4.078	0.000	2.533	2.401	2.315	0.021
Trust in financial matters	2.321	1.115	2.000	5.0	1.0	0.344	2.258	2.821	5.791	0.000	2.399	2.257	2.463	0.014
Confidence in Government	2.835	1.209	3.000	5.0	1.0	-0.083	2.822	2.935	1.106	0.270	2.855	2.819	0.583	0.560
Confidence in financial institutions	3.071	1.071	3.000	5.0	1.0	-0.283	3.047	3.268	2.565	0.011	3.105	3.044	1.097	0.273
Gender (2=female)	1.555	0.497	2.000	2.0	1.0	-0.221	1.591	1.262	-9.013	0.000	1.000	2.000	--	--
Age Mean	3.633	0.387	3.714	4.2	2.8	-0.412	3.653	3.472	-6.156	0.000	3.652	3.617	1.806	0.071
Same Country stay	2.515	2.215	1.000	6.0	1.0	0.866	2.456	2.988	2.819	0.005	2.854	2.243	5.327	0.000
Marital Status	2.209	1.038	2.000	5.0	1.0	0.466	2.212	2.179	-0.438	0.662	2.148	2.257	-2.068	0.039
Education	3.733	1.269	3.000	7.0	1.0	0.924	3.713	3.893	2.067	0.040	3.729	3.735	-0.096	0.924
Home Ownership	1.611	0.638	2.000	3.0	1.0	0.556	1.638	1.393	-5.191	0.000	1.518	1.686	-5.183	0.000
Debt	2.657	1.956	2.000	10.0	1.0	1.201	2.573	3.337	4.402	0.000	3.021	2.366	6.450	0.000
Savings	5.504	4.812	5.000	12.0	0.0	0.125	5.315	7.024	5.262	0.000	6.071	5.050	4.154	0.000
Income	4.456	3.421	4.000	14.0	0.0	0.638	4.366	5.179	3.695	0.000	4.612	4.331	1.608	0.108
Employment	3.114	2.423	2.000	8.0	1.0	0.650	3.210	2.339	-5.415	0.000	2.831	3.340	-4.111	0.000

Table 7 shows that the average risk tolerance is moderately low with considerable variability among respondents (Mean: 0.775, Std Dev: 1.675). The positive skewness of 2.063 suggests a large number of respondents leaning towards lower risk tolerance. This might indicate the presence of a general cautiousness or lack of confidence in cryptocurrency investments among the population sampled. Owners of cryptocurrency exhibit significantly higher risk tolerance than non-owners. Also, males exhibit higher risk tolerance than females.

Most respondents have limited to no past experience with cryptocurrency. The distribution is positively skewed, indicating that a smaller segment of the population has more substantial experience. Intentions to hold cryptocurrency in the future are moderate on average, with some variability. The distribution is slightly skewed positively, potentially indicate a growing market and a potential increase in adoption rates over time. Crypto owners have more past experience with cryptocurrency, which correlates with higher risk tolerance. Also, males have more past experience with cryptocurrency than females. The statistics show that individuals who currently own crypto are much more likely to intend to hold crypto in the future. Males show a higher intention to hold cryptocurrency in the future than females.

Knowledge levels are generally low with significant variability. The positive skewness suggests that a larger number of respondents have lesser knowledge. Owners have greater knowledge and familiarity with cryptocurrency. Also, crypto owners believe they understand cryptocurrencies better than non-owners. In terms of gender, males are more knowledgeable and familiar with cryptocurrency, and perceive themselves to have a stronger understanding of cryptocurrencies than females. There is a moderate perception of risk associated with cryptocurrencies, with a wide range of perceptions among respondents. The slight negative skewness suggests a small tilt towards higher risk perception. This may reflect concerns about volatility, regulatory status, and security of cryptocurrencies. Interestingly, crypto owners have a higher overall risk perception, perhaps due to greater awareness of the market specificity.

Trust and confidence levels in different areas (general, finance, government and institutions) are moderate, with a fairly balanced distribution. Aggregate trust is higher among crypto owners, but when disaggregated, trust in financial matters is notably higher among non-owners. Confidence in government and financial institutions does not significantly differ between the two groups. In terms of the gender differences, males have slightly higher aggregate trust and confidence in general matters, financial matters, and government than females.

In terms of demographics, the mean gender close to 1.555 with a median of 2 suggests a slightly higher proportion of females (1 and 2 represent male and female genders, respectively). The mean age is around 3.633 on the used log scale, with a slightly higher median, indicating a younger demographic. The negative skewness suggests a concentration of younger respondents. The average marital status is slightly above 2, suggesting a mix of single and married respondents. Though, the distribution has a mild positive skew. The mean of the *SameCountry* variable is 2.515 with a wide standard deviation and positive skewness that indicates a varied and uneven distribution. The respondents have a relatively high level of education on average. The distribution is positively skewed, indicating a considerable number of highly educated individuals. A mean and median close to 2 suggests a fair mix of homeowners and non-homeowners. Positive skewness indicates a slightly higher number of non-homeowners. Employment status varies among respondents, with a mean value of 3.114 and a slight positive skewness. A broad range of savings levels with a mean around 5.504 and a positive skewness suggests diverse financial standings among respondents. On the other hand, the average income is moderate with a fairly wide range, indicated by the positive skewness. The average debt level is moderate, but the range and positive skewness indicate that some respondents have high debt levels. Higher debt levels can influence risk aversion and financial decision-making.

3.3. Model

Effects of trust are calculated using several models to ensure robustness of empirical results. In particular, we employ probit/ logit, ordered logistic regressions, and tobit models. The particular choice of these models depends on the characteristics of the dependent variables.

In general, the model is specified as follows:

$$dependent\ variable = \alpha + \beta_1 variable\_of\_interest_1 + \cdots + \beta_m variable\_of\_interest_m + \beta_{m+1} control_1 + \beta_{m+2} control_2 + \cdots + \epsilon \quad (1)$$

where *dependent variable* is *Risk tolerance in cryptos*, *Current and future crypto ownership* or *Perceived riskiness*, depending on the hypothesis tested, *variable of interest* is represented by different combinations of the trust and knowledge measures, and controls are demographic variables. Thus, we estimate the following models given different types of dependent variables (see Table 2). For H1, we use ordered logistic regression given that the dependent variable is Risk tolerance in cryptos with the categories ranging from 1 (none) to 7 (higher than 50%). For H2, the logit/probit regressions are estimated using current crypto ownership as the dependent variable which can assume one of two possible values, i.e., Crypto assets / NFTs = 1 in case of crypto ownership, and 0, otherwise. Finally, for H3, the dependent variable is perceived crypto riskiness, bounded from 0 to 10, implying the use of a tobit [0..10] regression.

4. Empirical results

H1 - Cryptocurrency knowledge is likely to contribute to higher risk tolerance (ordered regression).

To test this hypothesis, we estimate the following regression that in its simplest form can be formalized as follows:

$$\begin{aligned}\text{Risk Tolerance in Cryptos} &= \alpha + \beta 1 \times \text{Finland} + \beta 2 \times \text{Sweeden} + \beta 3 \times \text{Aggregate Knowledge} \\ &+ \beta 4 \times \text{Aggregate Trust} + \beta 5 \times \text{Aggregate Confidence} \\ &+ \beta 6 \times \text{Past Experience} + \beta 7 \times \text{Control1} + \beta 8 \times \text{Control2} + \cdots + \epsilon\end{aligned}$$

Table 8. Ordered logistic regression result for testing H1.

Variable	Dependent variable: Risk tolerance in cryptos	Intercepts
	Estimate (std.error)	
CountryFinland	-0.224	Value Std. Error t value
	(0.220)	0|1 -2.1112 1.0732 -1.9673
CountrySweden	0.424*	1|2 -1.7468 1.0723 -1.6291
	(0.208)	2|3 -1.3377 1.0707 -1.2493
crypto_knowledge	1.350***	3|4 -0.2484 1.0718 -0.2318
	(0.123)	4|5 0.6336 1.0776 0.5880
aggregate_trust	0.159	5|6 1.4276 1.0834 1.3178
	(0.095)	6|7 3.5612 1.1295 3.1530
aggregate_confidence	-0.100	
	(0.089)	Residual Deviance: 1802.209
PastExperience	1.801***	AIC: 1848.209
	(0.139)	
Gender	-0.425*	
	(0.175)	
Age	-1.138***	
	(0.246)	
SameCountry	0.022	
	(0.037)	
MaritalStatus	-0.006	
	(0.088)	
Education	-0.106	
	(0.074)	
HomeOwnership	0.018	
	(0.143)	
Debt	0.163***	
	(0.046)	
Savings	0.044	
	(0.023)	
Income	-0.012	
	(0.029)	
Employment	-0.065	
	(0.043)	

Note: Observations -1,519; *p<0.05; **p<0.01; ***p<0.001

The results (Table 8) show interesting results. First, Sweden is associated with higher risk tolerance than baseline (Denmark), and this result is statistically significant (not for Finland, however). Second, as expected, our estimates indicate a strong positive and statistically significant association between crypto knowledge and risk tolerance (1.350***). We also observe a positive and strong statistical significance between past experience and risk tolerance (1.801***), implying that prior exposure to crypto assets make respondents more risk tolerant in general. The column

"Intercepts" for the ordered categories of the dependent variable "Risk Tolerance" demonstrate the thresholds between the respective categories. The higher the threshold estimate, the greater the propensity to be in a higher category of risk tolerance. The most significant threshold is 6|7 (estimate = 3.5612), suggesting a notable shift in propensity toward the highest category of risk tolerance.

To summarize, Crypto Knowledge (aggregate) and Past Experience with cryptocurrencies are strongly and positively associated with higher risk tolerance. Country of residence also plays a significant role, with Sweden showing higher risk tolerance than the baseline country (Denmark). Gender and age are important demographic factors, with females and older ages associated with lower risk tolerance. Debt levels are naturally positively associated with higher risk tolerance. Our results provide evidence in support of Hypothesis 1.

H2 - High trust individuals are more likely to participate in cryptocurrency investing than less trusting individuals (logit reg).

$$\begin{aligned}\text{Current crypto ownership} &= \alpha + \beta 1 \times \text{Finland} + \beta 2 \times \text{Sweeden} + \beta 3 \times \text{Aggregate Knowledge} \\ &+ \beta 4 \times \text{Aggregate Trust} + \beta 5 \times \text{Aggregate Confidence} \\ &+ \beta 6 \times \text{Past Experience} + \beta 7 \times \text{Overall risk perception} + \beta 8 \times \text{Control1} \\ &+ \beta 9 \times \text{Control2} + \cdots + \epsilon\end{aligned}$$

Table 9. Logistic regression result for testing H2

Variable	Dependent variable: Current crypto ownership Estimate (std.error)
CountryFinland	0.116 (0.274)
CountrySweden	-0.326 (0.277)
crypto_knowledge	0.989*** (0.154)
aggregate_trust	0.142 (0.125)
aggregate_confidence	-0.123 (0.114)
PastExperience	1.416*** (0.157)
overall_risk_perception	0.104* (0.048)
Gender	-0.608** (0.233)
Age	-0.390 (0.320)
SameCountry	-0.010 (0.049)
MaritalStatus	0.018 (0.119)
Education	-0.131 (0.099)
HomeOwnership	-0.225 (0.194)
Debt	-0.065 (0.060)
Savings	0.055 (0.029)
Income	-0.003 (0.040)
Employment	-0.033 (0.056)
Constant	-0.561 (1.423)
Observations	1,519
Log Likelihood	-329.591
Akaike Inf. Crit.	695.182

Note: *p<0.05; **p<0.01; ***p<0.001

Table 9 shows that the key predictors of current cryptocurrency ownership include crypto knowledge, past experience with cryptocurrencies, and overall risk perception. Of these, crypto knowledge and past experience show particularly strong positive associations. Aggregate trust and confidence do not have statistically significant effects. To test the robustness of our results in Table 9, we replicate the regression using separate measures of trust and confidence (and not aggregated as above).

The specification in its simplest form is the following:

$$\begin{aligned}\text{Current crypto ownership} &= \alpha + \beta 1 \times \text{Finland} + \beta 2 \times \text{Sweeden} + \beta 3 \times \text{Aggregate Knowledge} \\ &+ \beta 4 \times \text{Trust in fin. matters} + \beta 5 \times \text{Trust in generl matters} \\ &+ \beta 6 \times \text{Confidence in the government} \\ &+ \beta 7 \times \text{Confidence in financial institutins} + \beta 8 \times \text{Past Experience} \\ &+ \beta 9 \times \text{Overall risk perception} + \beta 10 \times \text{Control1} + \beta 11 \times \text{Control2} + \cdots \\ &+ \epsilon\end{aligned}$$

Just as in Table 9, results in table 10 demonstrate that crypto knowledge and past experience with cryptocurrencies remain the strongest predictors of cryptocurrency ownership, with a strong, positive, statistically significant relationship. Trust in financial institutions and overall risk perception are also positively associated with cryptocurrency ownership, while confidence in the governments shows a significant negative association, suggesting that lower confidence in government may be linked to a higher likelihood of owning cryptocurrency.

Table 10 Logistic regression with individual measures of trust and confidence (not aggregated)

Variable	Dependent variable: Current crypto ownership Estimate (std.error)
CountryFinland	0.061 (0.276)
CountrySweden	-0.308 (0.278)
crypto_knowledge	0.974*** (0.155)
TrustGeneral	-0.082 (0.108)
TrustFinance	0.229* (0.110)
ConfidenceGov	-0.207* (0.101)
ConfidenceInst	0.106 (0.111)
PastExperience	1.452*** (0.159)
overall_risk_perception	0.096* (0.048)
Gender	-0.631** (0.235)
Age	-0.397 (0.322)
SameCountry	-0.017 (0.049)
MaritalStatus	0.015 (0.119)
Education	-0.137 (0.100)
HomeOwnership	-0.247 (0.196)
Debt	-0.067 (0.060)
Savings	0.057 (0.029)
Income	0.003 (0.041)
Employment	-0.033 (0.057)
Constant	-0.524 (1.433)
Observations	1,519
Log Likelihood	-326.57
Akaike Inf. Crit.	693.139

Note: *p<0.05; **p<0.01; ***p<0.001

We also estimate the effect of trust and confidence on future holding of crypto assets via the following regression:

$$\begin{aligned}\text{Future crypto ownership} &= \alpha + \beta 1 \times \text{Finland} + \beta 2 \times \text{Sweeden} + \beta 3 \times \text{Aggregate Knowledge} \\ &+ \beta 4 \times \text{Trust in fin. matters} + \beta 5 \times \text{Trust in generl matters} \\ &+ \beta 6 \times \text{Confidence in the government} \\ &+ \beta 7 \times \text{Confidence in financial institutins} + \beta 8 \times \text{Past Experience} \\ &+ \beta 9 \times \text{Overall risk perception} + \beta 10 \times \text{Control1} + \beta 11 \times \text{Control2} + \cdots \\ &+ \epsilon\end{aligned}$$

Table 11 demonstrates that respondents from all countries show a significant positive association with future crypto holding. This indicates a higher likelihood of future cryptocurrency investment in these countries. A strong and positive relationship between crypto knowledge and future crypto holding is observed as well, i.e., higher crypto knowledge correlates with a greater likelihood of future investment in cryptocurrencies. The estimates show that aggregate trust positively influences future crypto holding, but when disaggregated, only trust in financial matters shows a significant positive impact. Higher overall risk perception is positively associated with future crypto holding.

Table 11 Ordered logistic regression results for future crypto holding

Variable	Dep. Var.: Future crypto holding (aggregated trust and confidence) Estimate (std. error)	Dep. Var. Future crypto holding (not aggregated trust and confidence) Estimate (std. error)
CountryFinland	0.415*** (0.123)	0.394** (0.124)
CountrySweden	0.501*** (0.122)	0.506*** (0.122)
crypto_knowledge	0.658*** (0.082)	0.632*** (0.083)
aggregate_trust	0.317*** (0.057)	-
aggregate_confidence	0.064 (0.051)	-
Trust in general matters	-	0.041 (0.052)
Trust in financial matters	-	0.278*** (0.052)
Confidence in government	-	0.067 (0.047)
Confidence in financial institutions	-	-0.002 (0.054)
PastExperience	0.577*** (0.112)	0.593*** (0.112)
overall_risk_perception	0.327*** (0.020)	0.329*** (0.020)
Gender	0.061 (0.103)	0.057 (0.103)
Age	-0.935*** (0.143)	-0.928*** (0.144)
SameCountry	0.007 (0.022)	0.006 (0.022)
MaritalStatus	0.043 (0.047)	0.037 (0.047)
Education	0.045 (0.039)	0.042 (0.039)
HomeOwnership	0.132 (0.082)	0.132 (0.082)
Debt	0.077** (0.027)	0.075** (0.027)
Savings	0.016 (0.012)	0.016 (0.012)
Income	-0.037* (0.017)	-0.033* (0.017)
Employment	-0.026 (0.021)	-0.027 (0.021)
Observations	1,519	1,519
Intercepts:	Value Std. Error t value 0|1 -2.1052 0.6658 -3.1620 1|2 -0.1643 0.6638 -0.2476 2|3 0.1979 0.6632 0.2983 3|4 0.5186 0.6629 0.7824 4|5 0.7967 0.6630 1.2017 5|6 1.3570 0.6637 2.0445 6|7 1.9591 0.6650 2.9458 7|8 2.6090 0.6668 3.9129 8|9 3.2878 0.6695 4.9109 9|10 3.9457 0.6737 5.8567	Value Std. Error t value 0|1 -2.1238 0.6670 -3.1842 1|2 -0.1787 0.6649 -0.2688 2|3 0.1846 0.6643 0.2780 3|4 0.5061 0.6640 0.7622 4|5 0.7844 0.6641 1.1812 5|6 1.3459 0.6648 2.0244 6|7 1.9499 0.6661 2.9272 7|8 2.6021 0.6678 3.8962 8|9 3.2840 0.6705 4.8976 9|10 3.9442 0.6748 5.8453
	Residual Deviance: 5835.547. AIC: 5889.547	Residual Deviance: 5827.475. AIC: 5885.475

H3: Trust is likely to have a positive effect on the perceived riskiness of cryptocurrency investment (tobit).

The models are specified as follows:

Model 1:

Overal perceived riskiness

$$= \alpha + \beta 1 \times \text{Finland} + \beta 2 \times \text{Sweeden} + \beta 3 \times \text{Aggregate Knowledge}$$
$$+ \beta 4 \times \text{Trust in fin. matters} + \beta 5 \times \text{Trust in generl matters}$$
$$+ \beta 6 \times \text{Control1} + \beta 7 \times \text{Control2} + \cdots + \epsilon$$

Model 2:

I consider crypto to be risky

$$= \alpha + \beta 1 \times \text{Finland} + \beta 2 \times \text{Sweeden} + \beta 3 \times \text{Aggregate Knowledge}$$
$$+ \beta 4 \times \text{Trust in fin. matters} + \beta 5 \times \text{Trust in generl matters}$$
$$+ \beta 6 \times \text{Control1} + \beta 7 \times \text{Control2} + \cdots + \epsilon$$

Model 3:

I consider crypto to be risky

$$= \alpha + \beta 1 \times \text{Finland} + \beta 2 \times \text{Sweeden} + \beta 3 \times \text{Aggregate Knowledge}$$
$$+ \beta 4 \times \text{Aggregate trust} + \beta 5 \times \text{Control1} + \beta 6 \times \text{Control2} + \cdots + \epsilon$$

Table 12. Regression results for H3

Variable	Model 1 - Dep. Var.: overall perceived riskiness (not aggregated trust)	Model 2 - Dep. Var.: I consider cryptocurrency to be a risk (not aggregated trust)	Model 3- Dep. Var.: I consider cryptocurrency to be a risk (aggregated trust)
	Estimate (std.error)	Estimate (std.error)	Estimate (std.error)
1	2	3	4
CountryFinland	0.540*	0.219	0.186
	(0.219)	(0.391)	(0.389)
CountrySweden	0.110	0.052	0.062
	(0.217)	(0.387)	(0.387)
crypto_knowledge	0.854***	0.203	0.176
	(0.130)	(0.231)	(0.230)
TrustGeneral	0.015	-0.040	-
	(0.091)	(0.162)	
TrustFinance	-0.083	- 0.349*	-
	(0.092)	(0.163)	
Aggregate_trust	-	-	-0.387*
			(0.167)
Gender	-1.378***	-1.700***	-1.707***
	(0.180)	(0.324)	(0.324)
Age	0.077	1.526***	1.529***
	(0.252)	(0.445)	(0.445)
SameCountry	-0.011	-0.139*	-0.14*
	(0.039)	(0.07)	(0.07)
MaritalStatus	0.017	0.172	0.167
	(0.085)	(0.152)	(0.151)
Education	0.173*	0.108	0.103
	(0.070)	(0.125)	(0.125)
HomeOwnership	-0.193	-0.506	-0.509
	(0.149)	(0.264)	(0.264)
Debt	0.101*	0.102	0.100
	(0.049)	(0.087)	(0.087)
Savings	0.059**	0.059	0.059
	(0.022)	(0.038)	(0.038)
Income	0.013	0.054	0.058
	(0.030)	(0.053)	(0.053)
Employment	-0.052	0.054	0.053
	(0.038)	(0.068)	(0.068)
logSigma	1.157***	1.694***	1.695***
	(0.021)	(0.027)	(0.027)
Constant	6.019***	4.223*	4.273*
	(1.148)	(2.036)	(2.036)
Observations	1,519	1,519	1,519
Log Likelihood	-3,582.01	-3,374.91	-3,375.53
Akaike Inf. Crit.	7,198.01	6,783.83	6,783.06
Bayesian Inf. Crit.	7,288.55	6,874.37	6,868.27

Note: Newton-Raphson maximisation. *p<0.05; **p<0.01; ***p<0.001

Table 12 shows that being in Finland, as opposed to the baseline country (Denmark), is associated with a higher overall risk perception. Being in Sweden, however, does not significantly change the overall crypto risk perception. Again, our results suggest a strong and statistically significant positive association between crypto knowledge and overall risk perception. While trust variables have a negative effect on the dependent variables, trust in financial matters shows a significant negative impact on perceived riskiness when we consider only responses to the statement "I consider cryptocurrency to be a risk". This variable specifically captures the general risk perception towards cryptocurrency. The narrower focus on a singular aspect of risk perception may allow for a more direct assessment of how trust (especially *TrustFinance*) influences this perception. This suggests that individuals who have lower trust in financial matters are more likely to perceive cryptocurrencies as highly risky.

On the other hand, "*overall perceived riskiness"*, is an aggregate measure, averaging responses to various statements about the perceived riskiness of cryptocurrency, including its volatility, legal status, regulation, and vulnerability to cyber-attacks, and therefore covers a broad range of risk perceptions. Therefore, the influence of trust might be diluted or interact differently with these various aspects, and as a consequence, in this broader measure of risk perception, trust factors may end up being overshadowed by other omitted factors that influence overall risk perception, such as knowledge about cryptocurrency, general attitudes towards new financial technologies, or personal investment experiences.

We also estimate the effects of aggregate trust on the singular aspect of risk perception. The estimate for the aggregate trust variable is -0.387* (std error=0.167), indicating statistically significant negative impact of trust on cryptocurrency risk perception (column 4 of Table 11).

6. Discussion

Our findings that investors with higher financial, and in particular cryptocurrency, knowledge are willing to accept higher investment risk (H1), confirm prior studies that link financial knowledge to increased risk tolerance for investing in traditional asset classes, e.g., Bellofatto et al. (2018). Additionally, research illustrates how investment knowledge is crucial for engaging in financial investing (Bianchi, 2018), for analysing and understanding investment options (Klapper and Lusardi, 2020; Calcagno and Monticone, 2015), and to stimulate investments into sophisticated financial products (Bannier and Neubert, 2016). Our first contribution to the literature is therefore to reveal that the link between knowledge and risk tolerance holds also for the more alternative, and less regulated, asset cryptocurrency. Our findings suggest that educating individuals about cryptocurrencies (and other novel financial products) could increase their willingness to engage with and invest in cryptocurrencies.

While our aggregate trust measure does not influence cryptocurrency ownership (H2), our study reveals decomposed effects. Notably, trusting strangers in relation to financial matters influence both current and future cryptocurrency participation positively, whereas confidence in government influences future participation negatively. Our final consideration about the relationship between trust and the perceived riskiness of cryptocurrency investment (H3), emphasise the nuanced influence of trust. Overall, our four trust measures have a diluted influence on overall perceived riskiness, but all four significantly reduce the perception of risk when focusing specifically on cryptocurrency. Therefore, we conclude that trust has a situation effect and varies depending on how risk perception is measured. Focusing on the specific aspect of perceiving cryptocurrency as a risk, both aggregate trust and trusting strangers in relation to financial matters have significant negative impacts on the perceived riskiness of cryptocurrency investing. Trusting strangers in relation to financial matters therefore decreases how risky investors perceive cryptocurrencies to be and increases their likelihood to participate.

Our finding that trusting strangers with financial matters for investment participation confirms Kaustia, Conlin and Luotonen (2023) in relation to trusting financial intermediation and stock market participation. Until the present study, trust in relation to cryptocurrency investment has been less clear. Our study makes a specific contribution to Jalan et al. (2023) who document a negative association between interpersonal distrust and cryptocurrency interest across several countries but excluding the Nordics. While their study documents the potential importance of trust for crypto participation, we contribute by introducing four dimensions of trust, i.e., trust in strangers relating to general and financial matters as well as their confidence in government and financial institutions. Further, we collect data by surveying active individual investors in three particularly high trusting and high stock market participating Nordic countries, Denmark, Finland and Sweden.

We also contribute to literature that correlates trust and traditional stock market participation, e.g., Guiso, Sapienza, and Zingales (2008), and Balloch, Nicolae, and Philip (2015), extending it to the cryptocurrency domain. Extant literature evidence that both generalised trust as measured in the World Values Survey (Guiso, Sapienza and Zingales, 2008) and trust in relation to financial intermediation (Kaustia, Conlin, and Luotonen, 2023), unlock higher stock market participation. Despite the anonymous nature of blockchain, trust has a positive influence on innovation adoption and financial market development (e.g. Kirs and Bagchi, 2012; Alalwan et al. 2018; Guiso et al., 2004; Guiso, Sapienza and Zingales, 2008).

However, those results do not directly translate to cryptocurrency market, suggesting that the role of trust for risk perception in the cryptocurrency market differs from that in traditional financial markets. In revealing that trusting financial advice from strangers is the most important trust measure to influence crypto participation, our findings suggest that trust has a more nuanced relationship to participation in cryptocurrencies than it does on stock market participation. Our finding is perhaps unsurprising given the non-traditional and more unregulated nature of the

cryptocurrency market. Investors are therefore required to trust novel systems and other anonymous market actors as well as accepting financial advice from unfamiliar sources. This research highlights the needs for future scholars to continue the exploration of investor sentiment in relation to cryptocurrencies. In particular, studies can explore investor opinions in relation to fraud and possible market regulation. Our results that trust underpin growth have broad relevance to the actors in the crypto market and to regulators who evaluate the need for regulation.

7. Conclusion

We investigate whether trust influences investor risk perception and participation in cryptocurrency assets among 1,519 individual investors in three countries with a generally high trusting and high stock market participating populations, Denmark, Finland and Sweden. Our results evidence that people who are trusting towards strangers in relation to financial matters consider cryptocurrencies as less risky than their less trusting peers. Trust therefore has a mediating effect on risk perception. These trusting individuals are also more likely to be current holders of cryptos and to participate in future purchases. Additionally, our findings demonstrate that highly knowledgeable individuals are willing to accept higher investment risk. We contribute to extant studies that link trust to stock market participation and reveal more nuanced effects for the novel and less regulated cryptocurrency market.

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