

Familiarity with Crypto and Financial Concepts: Cryptoasset Owners, Non-Owners, and Gender Differences

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Abstract

In the rapidly evolving landscape of digital asset markets, measuring cryptoasset knowledge alongside financial knowledge enhances our understanding of individuals' decisions to purchase cryptoassets. Using microdata from the Bank of Canada's Bitcoin Omnibus Survey, we measure familiarity with crypto concepts using a set of three questions covering basic aspects of Bitcoin. Familiarity with financial concepts is measured using a set of three questions covering basic aspects of conventional finance. We also consider gender differences across these measures. A novel aspect of this paper is an empirical joint analysis that allows us to consider the interrelationship between these two measures of crypto and financial knowledge.

Topics: Central bank research, Digital currencies and fintech, Econometric and statistical methods

JEL codes: C81, D14, D91, G53, O51

Résumé

Le marché des actifs numériques évoluant rapidement, il est utile de mesurer les connaissances des gens sur les cryptoactifs et la finance pour mieux comprendre ce qui les amène à acheter de tels actifs. Partant des microdonnées de l'enquête-omnibus sur le bitcoin menée par la Banque du Canada, nous produisons deux mesures de ces connaissances : l'une en fonction de trois questions de base sur le système Bitcoin et l'autre, en fonction de trois grandes questions sur la finance traditionnelle. Nous nous penchons aussi sur les différences entre les genres pour chaque mesure. Cette étude innove du fait qu'elle repose sur une analyse empirique combinée qui nous permet d'examiner l'interrelation entre les connaissances sur les cryptoactifs et les connaissances financières.

Sujets : Recherches menées par les banques centrales, Monnaies numériques et technologies financières, Méthodes économétriques et statistiques

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1 Introduction

Introduced by Nakamoto (2008), Bitcoin was designed to function as a peer-to-peer electronic cash system outside the system established by central banks and intermediary financial institutions. Bitcoin was touted as both a payment method and a financial asset, attracting considerable attention and investment worldwide.² However, due to its inherent volatility and inefficiency as a payment method, Bitcoin has evolved into more of an investment product rather than a reliable means of payment (Balutel, Engert et al., 2022; Henry, Huynh, and Nicholls, 2019; Stix, 2021).

The Bank of Canada monitors and conducts research on Bitcoin and other cryptoassets for several reasons. One concerns the potential issuance of a central bank digital currency (CBDC). In this regard, Lane (2020, 2021) sets out the two conditions that would lead the Bank to consider issuing a CBDC: if cash could no longer be used for a wide range of transactions, or if private digital currencies, including cryptocurrencies, make serious inroads as an alternative payment method.

The Bank also analyzes the potential financial stability implications of cryptoasset markets. As noted in the *Financial System Review* (2022):

Cryptoasset markets continue to evolve and grow rapidly, and price volatility remains high. While they do not yet pose a systemic risk to the Canadian financial system, the lack of a regulatory framework means they operate without many of the safeguards that exist in the traditional financial system. This exposes investors to risks such as large and sudden financial losses due to fraud, price declines or a run on stablecoins.

In this regard, Balutel, Engert et al. (2022) find evidence from survey data that in 2021, 25% of Canadian cryptoasset owners experienced price crashes. Other adverse incidents reported include lost access to a digital wallet (11%), initial coin offering scams (7%), stolen funds (7%), and data breaches (6%).³

More recently, the Bank's *Financial System Review* (2023) found that:

Cryptoasset markets do not currently represent a significant concern for the stability of the Canadian financial system. They remain small and mostly separate from the financial system. If they do become more interconnected, shocks

² The price of one Bitcoin reached an all-time high of over \$63,000 USD in 2021 with an associated market capitalization of over \$1T USD, based on data from CoinMarketCap.

³ The Canadian Securities Administrators identify four primary risks associated with investing in crypto assets: significant price volatility, lack of liquidity, challenges in identifying intermediary entities, and susceptibility to cybersecurity threats.

in these markets could spread to the broader financial system and affect financial stability.

Note that in July 2023, Canada's banking and insurance regulator, the Office of the Superintendent of Financial Institutions (OSFI), set out its regulatory requirements for banks' and insurers' exposures to cryptoassets, to come into effect in 2025. These requirements replace the interim OSFI advisory on cryptoassets that was released in 2022 (Office of the Superintendent of Financial Institutions, 2023a, 2023b).

In this paper, we explore Canadians' understanding of basic crypto and financial concepts and the interrelationship between the two. There are a few motivations for this paper. First, if crypto markets were to become more interconnected with the traditional financial system, sound investor knowledge and decision-making could help mitigate risks to financial stability. Second, sound crypto and financial knowledge on the part of consumers can help reduce their exposure to fraud and scams prevalent in crypto markets. More generally, informed decision-making helps individuals navigate the complexities of investing in cryptoassets.

Using the Bank of Canada's Bitcoin Omnibus Survey (BTCOS), we measure familiarity with both crypto and financial concepts in Canada. Following Henry et al. (2018a), we measure crypto knowledge by assessing individuals' understanding of three basic facts about the Bitcoin system: specifically, whether the Bitcoin supply is fixed; if Bitcoin is backed by the government; and if Bitcoin uses distributed ledger technology.

We also use the *Big Three* financial literacy questions of Lusardi and Mitchell (2014), focusing on knowledge of compound interest, the effect of inflation, and risk diversification, which are crucial economic concepts for informing saving and investment decisions. These questions may not capture all dimensions of financial literacy, and they have been expanded to cover more advanced knowledge about mortgages and bond prices. However, the Big Three cover critical basic aspects, and have been widely used in the literature to measure financial literacy (see, for example, Lusardi and Mitchell (2023)). Further, these questions can be adapted to survey settings where space and respondent attention is limited. Widespread use of this method allows for comparability across studies and facilitates broad and informed discussion of financial literacy and policy implications.

Our analysis is primarily descriptive, with an emphasis on presenting relevant statistics to assess crypto and financial knowledge among Bitcoin owners and non-owners in Canada, as well as any related gender differences. This builds on previous research (Balutel, Engert et al., 2022; Balutel, Felt et al., 2023), which documents broader findings from the BTCOS related to awareness, ownership, and use of Bitcoin by Canadians. Analysis of crypto and financial

knowledge, the core interest of the current paper, is considered only briefly in that earlier work. Most closely related to the current paper is Bannier et al. (2019), which uses six questions to measure Bitcoin knowledge and documents a gender gap. While that analysis concerns the overall U.S. population, our paper compares crypto and financial knowledge of both the overall Canadian population and the subpopulation of Canadian Bitcoin owners. Further, a key assumption that Bannier et al. (2019) make is that financial literacy can help explain crypto literacy—in particular, that the gender gap in financial literacy explains a sizable portion of the gender gap in crypto literacy. By contrast, we use a joint bivariate model to examine the two measures of crypto and financial knowledge. This model allows us to capture how these two variables influence each other, rather than treating them as separate and independent. Our model assumes that there are both observed factors, including demographic characteristics, and, importantly, *unobserved* factors, that can affect crypto and financial knowledge simultaneously. Such unobserved factors could account for traits such as confidence.

Key findings of this paper are as follows.

- *Familiarity with crypto concepts.* We find significant differences in crypto knowledge between males and females, regardless of Bitcoin ownership status. This could be partially explained by the fact that women tended to choose “don’t know” responses to the crypto questions more often than men, which is consistent with previous studies that explore confidence as a possible contributor to the gender gap in financial literacy measures (Bucher-Koenen et al., 2017, 2021; Cupák et al., 2020; Hospido et al., 2024).
- *Familiarity with financial concepts.* We find no significant gender differences in general financial knowledge among Bitcoin owners. However, among non-owners, women were less likely than men to answer financial knowledge questions correctly and more likely to respond with “don’t know”. Just under a third of women in the sample of non-owners are classified as having a high level of financial knowledge, compared with half of the men. Given the low rate of Bitcoin ownership in Canada, these results could indicate broader trends in financial knowledge, consistent with the findings in the literature on the gender gap (e.g., Lusardi and Mitchell, 2014).
- *Joint crypto and financial knowledge.* The joint conditional analysis empirically supports the existence of a gender gap in both crypto and financial knowledge among non-owners, but only in crypto knowledge among Bitcoin owners. The analysis also reveals that familiarity with crypto and financial concepts is not independent among respondents. There is a positive and statistically significant correlation between the two scores, which can be attributed to unobservable factors

(*positive selection*). This implies that individuals who demonstrated higher levels of crypto knowledge are more likely to exhibit higher levels of financial knowledge, and vice versa. Moreover, this effect is more pronounced among Bitcoin owners than non-owners.

The rest of the paper is organized as follows. Section 2 presents a literature review, while Section 3 describes the data used in the analysis and the construction of the literacy measures. Section 4 presents the unconditional analysis related to crypto and financial knowledge among Bitcoin owners and non-owners with a focus on gender differences. Then Section 5 discusses the conditional analysis of crypto and financial knowledge. Section 6 concludes and suggests future work.

2 Literature Review

The percentage of Canadians who own Bitcoin increased significantly from 5% in 2018–2020 to 13% in 2021 (Balutel, Engert et al., 2022), with the highest concentration of ownership observed among men.⁴ The surge in media attention, ease of access to cryptoassets, and a fear of missing out (FoMO), has likely influenced individuals who typically avoid high-risk investments to participate. As highlighted by Gerrans et al. (2023), FoMO is a widely acknowledged motivator for cryptocurrency investment. Therefore, investors benefit from a solid foundation in crypto and financial knowledge, as this can help individuals understand and navigate their engagement with such assets. In a recent survey, the Ontario Securities Commission (2022) finds that while 51% of Canadians knew the correct definition of cryptoassets, their average score on a related knowledge test was only 37%, indicating limited understanding of practical, legal and regulatory aspects of crypto. A U.S. study highlights a significant gap in familiarity with crypto concepts, revealing that 91% of participants failed a crypto knowledge test despite increased awareness fueled by media attention (CryptoLiteracy, n.d.). Additionally, Bannier et al. (2019) show that respondents could correctly answer only 3 out of 6 crypto-related questions on average.⁵ Their research also finds a gender gap in crypto knowledge and estimates that financial knowledge alone accounted for approximately 40% of this observed gender gap in understanding characteristics of Bitcoin.

⁴ This trend of gender divide is documented for the United States (Schuh and Shy, 2016), Austria (Stix, 2021), Japan (Fujiki, 2020, 2021), and across all studies conducted in Canada (Henry et al., 2018a; Henry, Huynh, and Nicholls 2019; Balutel, Felt et al., 2023; Balutel, Engert et al., 2022; Ontario Securities Commission, 2022).

⁵ This study incorporates some Bitcoin-related questions from the BTCOS conducted by the Bank of Canada (Henry et al., 2018a).

Familiarity with financial knowledge is another key interest for this paper. Studies suggest that cryptoasset owners in Japan (Fujiki, 2020) and Austria (Stix, 2021) have more financial knowledge than non-owners. In contrast, Bitcoin ownership in Canada has historically been more common among those with limited financial knowledge, although the share of those with high financial knowledge increased in 2021 (Balutel, Engert et al., 2022; Balutel, Felt et al., 2023). Further, Fujiki (2021) explores the heterogeneity of Japanese cryptoasset owners and finds that those owners without investment experience in risky conventional assets display lower levels of financial understanding relative to both cryptoasset owners and non-owners with investment experience. In the context of the gender gap in financial literacy, a substantial body of literature emphasizes a widely recognized difference between genders with regard to financial knowledge.

This discrepancy has been shown to affect economic behavior such as participation in financial markets, which affects wealth accumulation and financial well-being (Lusardi and Mitchell, 2011a; Bucher-Koenen et al., 2017; Lusardi and Mitchell, 2011b; van Rooij et al., 2011; Bucher-Koenen et al., 2021). In addition, Bucher-Koenen et al. (2017) document that women are more likely than men to select “don’t know” responses across measures of financial literacy. In a later study, however, the authors find that women often choose the correct answer when the “don’t know” option is unavailable (Bucher-Koenen et al., 2021). Hospido et al. (2024) further explore the gender gap in financial literacy by focusing on measurement aspects and proposing interventions to address response biases. They find that three interventions—removing the “Don’t know” option, providing monetary incentives, and offering information on gender-based response patterns—are effective in reducing the tendency to choose “Don’t know.” However, only the prior provision of information on gender-based responses significantly reduces both the gender gap in choosing “don’t know” and the measured gender gap in financial literacy.

Blockchain technology, the underlying technology behind some cryptoassets, such as Bitcoin, has attracted significant attention. Some proponents argue that blockchain technology has the potential to mitigate the digital divide and enhance financial inclusion, as indicated by Hydary (2019). However, Carmona (2022) contends that the anticipated benefits of cryptoassets for financial inclusion have not materialized. Koskelainen et al. (2023) explore financial behavior in digital environments, concluding that digital financial knowledge is distinct from both financial literacy and digital literacy, and its measurement is relatively underdeveloped.

3 Bitcoin Omnibus Survey

This paper uses data on cryptoasset ownership from the Bank of Canada’s Bitcoin Omnibus

Survey, specifically analyzing three iterations conducted in 2018, 2019, and 2021.⁶ The BTCOS is designed by the Bank of Canada staff, and fieldwork is conducted by the market research firm Ipsos. The survey uses an online and device-agnostic methodology, meaning that it can be completed on any device—computer, laptop, mobile phone, tablet, etc.—that can be used to access the internet. Quota-based sampling is used for recruiting respondents to the BTCOS to match nested population targets defined by age, gender, and region. The final sample sizes are 1,987 in 2018, 1,987 in 2019, and 1,974 in 2021. Among these, there are 99, 89, and 121 Bitcoin owners each year, respectively. The data are cleaned and the sample is weighted using an iterative raking procedure (Deville et al., 1993) to produce survey weights that ensure the survey is representative along numerous demographic dimensions as measured by the 2016 Canadian census.⁷

3.1 Development of the BTCOS

The inaugural version of the BTCOS was conducted in 2016 as a pilot study, with a narrow focus on measuring levels of awareness and ownership of Bitcoin in Canada. With the exception of 2020, the survey has since been conducted annually during the month of December. Following the pilot, each subsequent version of the survey instrument contained additional content aimed at better understanding factors driving Bitcoin adoption. For previous versions of the BTCOS, see also the following reports: Henry et al. (2017); Henry et al. (2018b); Henry, Huynh, Nicholls, and Nicholson (2019); and Balutel, Felt et al. (2023).

The survey instrument covers various aspects related to Bitcoin, such as awareness, ownership, reasons for ownership/non-ownership, use in payments or person-to-person transactions, holdings, beliefs about its future survival and adoption levels among Canadians, price expectations over the next month, and methods of purchasing. The BTCOS survey also includes inquiries about alternative cryptocurrencies to Bitcoin (altcoins) and considers security incidents and price crashes experienced by both Bitcoin and altcoin owners. Additionally, for both cryptoasset owners and non-owners, the BTCOS has gathered information about cash holdings. Finally, of particular relevance to this paper, the BTCOS measures levels of crypto and financial literacy.⁸

3.2 Crypto and financial knowledge measures

⁶ Financial literacy questions developed by Lusardi and Mitchell (2014) were introduced in the BTCOS survey for the first time in 2018.

⁷ A full description of the methodology for the BTCOS can be found in Balutel, Engert et al. (2022).

⁸ The full survey instrument, used for the 2021 iteration, can be found in the Appendix.

Exploring the intersection of finance and digitalization, Koskelainen et al. (2023) outlines three pivotal themes: financial technology (known as fintech), financial behavior in digital environments, and behavioral interventions. A key observation of that study is that the measurement of digital financial literacy has remained underdeveloped compared with the measurement of financial or digital literacy. The BTCOS uses separate measures to assess crypto and financial knowledge based on two sets of three questions that cover fundamental aspects, shown in Tables 1 and 2. We use the term “literacy” to ensure consistency with terminology widely adopted in financial and digital literacy research.

The crypto literacy questions developed by Henry et al. (2018a) consist of three true-or-false statements concerning basic facts about the Bitcoin system. Bitcoin is the most well-known and market-dominant cryptoasset, and knowledge of these facts indicates an understanding of this asset. The questions are featured in a national library of financial literacy measures,⁹ which supports the country’s primary consumer protection agency in its efforts to monitor and improve Canadians’ skills in navigating the financial marketplace (Financial Consumer Agency of Canada, 2021). The measure has also been referenced in Bannier et al. (2019), and one of the questions that the Organization for Economic Co-operation and Development (OECD) uses to assess digital financial literacy (OECD, 2022) is similar to one of the true-or-false statements in the BTCOS (concerning government backing).

The *Big Three* questions developed by Lusardi and Mitchell (2014) measure financial literacy by assessing understanding of compound interest, the effect of inflation, and risk diversification. These questions have been used in surveys around the world (Lusardi and Mitchell, 2023) and have become standard in the literature. Even a small number of questions can yield meaningful insights into financial literacy, particularly when they have been rigorously studied and proven reliable over time.

In our paper, we compute a crypto and financial literacy score for each respondent as the number of correct answers minus the number of incorrect answers (“don’t know” responses do not contribute to the score). Incorrect answers are deducted in order to penalize survey respondents who guess since guesses are potentially associated with respondents’ risk-tolerance levels. Therefore, this score can take on integer values from -3 to 3 . Crypto literacy is then classified as “high” (score = 3), “medium” (score = 1, 2), or “low” (score ≤ 0). Financial literacy categories are constructed in the same way.

Our scoring methodology diverges from the conventional approach found in the literature (Lusardi and Mitchell, 2011b), which typically classifies individuals answering all three questions correctly as having high literacy and the rest as having low literacy. By

⁹ See the Measures Library on the Financial Consumer Agency of Canada website.

assigning a value of zero to a “don’t know” answer and -1 to “incorrect” answers, our approach yields comparable insights to the conventional method for the high category but distinguishes between two different types for those not in the high category. The decision to give a zero weight to a “don’t know” answer stems from the difficulty in distinguishing between a genuine lack of knowledge, a lack of confidence, or financial anxiety. Bucher-Koenen et al. (2021) identifies that the use of “don’t know” in response to financial knowledge questions by women is frequently linked to a lack of confidence, contributing to roughly one third of the observed literacy gap, while Tinghög et al. (2021) suggests that financial anxiety stemming from a stereotype threat for women in the financial domain can play a role in contributing to the observed gender gap.

4. Unconditional analysis of crypto and financial literacy

In this section, we provide a descriptive analysis of crypto and financial literacy levels among Canadians by aggregating data from the 2018, 2019, and 2021 iterations of the BTCOS survey. Our primary focus is on exploring crypto and financial literacy among distinct ownership groups: non-owners (individuals without Bitcoin holdings) and Bitcoin owners, with an emphasis on gender differences. Our analysis also considers how other demographic factors influence crypto and financial literacy. Lastly, we present the distribution of combined crypto and financial literacy levels among Bitcoin owners and non-owners.

4.1 Crypto and financial literacy: Overall results

In general, awareness of the term “Bitcoin” among the Canadian population is high and has remained stable at about 90% since 2018 (Balutel, Engert et al., 2022). However, the left panel of Figure 1 shows that the level of understanding of how Bitcoin actually works—i.e., the level of crypto literacy—is quite low. Just 5% of non-owners displayed high crypto literacy, while a substantial 64% were identified with low literacy. Among Bitcoin owners, the distribution of crypto literacy reflects varying levels of understanding. Perhaps surprisingly, 32% exhibit a low understanding of Bitcoin features, while conversely 31% have a high level of crypto literacy. The remaining 37% fall in the middle, demonstrating a moderate level of crypto literacy.

The right panel of Figure 1 shows the distribution of financial literacy for the pooled data. Specifically, among non-owners, 39% have a high level of financial literacy, while 35% are in the medium category, and 25% are in the low category. In contrast, a clear polarization in financial literacy is evident within the cohort of Bitcoin owners. Specifically, 40% of Bitcoin

owners are categorized as having low financial literacy, while 37% fall into the high financial literacy category.

A trend among Bitcoin owners, as reported by Balutel, Felt et al. (2023) and Balutel, Engert et al. (2022), indicates a doubling of the percentage of individuals with low crypto literacy, climbing from 19% in 2018 to 40% in 2021. At the same time, the overall share of Bitcoin owners with high financial literacy has steadily increased. The price of Bitcoin soared during the COVID-19 pandemic, attracting investors looking for quick profits, but many jumped in without fully understanding the market complexities and risks involved. The 2021 BTCOS includes a novel question measuring the duration of Bitcoin ownership: “When did you first obtain Bitcoin?”.¹⁰ Figure 2 shows that long-term owners, commonly known as early adopters, generally demonstrate better performance on crypto and financial literacy measures than recent owners (those who purchased Bitcoin starting in 2020), often referred to as late adopters. This difference could be attributed to the advantage early adopters have in terms of their more prolonged exposure and engagement in the market, while the entry of short-term owners reflects widespread media attention and hype.

Table 3 presents the proportions of crypto and financial literacy among Canadian Bitcoin owners according to various demographic categories.¹¹ When examining the results of crypto literacy by gender, we observe that females have a higher proportion in the low crypto literacy category (43%) compared with males (28%). Conversely, males have a larger proportion in the high category (37%) compared with females (17%). Additionally, low crypto literacy is prevalent among Bitcoin owners who ended their formal education with high school diplomas.

The distribution of financial literacy tends to be split between the low and high categories across most demographic groups. When examining the results by gender, we see that females have a slightly higher proportion of individuals with low financial literacy (43%) compared with their male counterparts (38%). Nevertheless, both males and females exhibit a similar share in the high category (37%). When other demographic factors are examined, Bitcoin owners who ended their studies with a high school diploma or those with low incomes are more inclined to demonstrate low financial literacy. In contrast, older owners with a university degree or high income tend to show greater financial literacy.

4.2 Crypto and financial literacy: Gender differences

This section explores unconditional gender-specific disparities in crypto and financial literacy

¹⁰ Balutel, Engert et al. (2022) review numerous ways in which recent owners differ from long-term ones (see Section 5).

¹¹ Some sub-groups had a small number of observations; therefore, evidence should be interpreted with caution.

within Bitcoin owner and non-owner cohorts. Revealing gender-specific patterns can help to ensure that various investors understand the risks they undertake when investing in cryptoassets.

Figure 3a presents crypto literacy distributions based on Bitcoin ownership and gender. Among non-owners, 56% of males and 71% of females fall into the low crypto literacy category, while among Bitcoin owners 28% of males and 43% of females demonstrated low crypto literacy. Additionally, a small percentage of non-owners (7% of males and 2% of females) exhibit high crypto literacy, while Bitcoin owners, particularly males (37%), surpass females (16%) in high crypto literacy. These results underscore a persistent gender gap in crypto literacy, with women consistently exhibiting a lower understanding of Bitcoin characteristics across both ownership categories. If financial literacy is associated with participation in asset markets, does this suggest that female Bitcoin owners tend to have higher levels of financial literacy than their female counterparts who do not own Bitcoin? If so, could this imply that the gender gap is narrower when comparing female Bitcoin owners with male Bitcoin owners?

As illustrated in Figure 3b, the distribution of financial literacy measures reveals insights regarding gender differences among Bitcoin owners and non-owners. Among non-owners, a clear gender gap is evident in the low financial literacy category, where 32% of females fall into this bracket, compared with 19% of males. In contrast, among Bitcoin owners, the gender difference in low financial literacy is less pronounced, with 43% of females and 38% of males falling into this category. In the medium financial literacy category, gender differences are less significant for both non-owners (39% females, 31% males) and owners (21% females, 25% males).

The high financial literacy category displays a noteworthy gender shift. Among non-owners, males dominated the high financial literacy category, constituting 50% compared with 29% of females. Surprisingly, among Bitcoin owners, the gender gap in high financial literacy narrows, with 37% of both males and females falling into this category. Upon an examination across the two groups of Bitcoin owners and non-owners, the most noticeable contrast emerges among males, where Bitcoin owners exhibited lower financial literacy than non-owners.¹² Nevertheless, among females, there were no notable average differences in financial literacy scores, even though there was a higher proportion of individuals with advanced financial literacy among female Bitcoin owners. The results suggest a nuanced relationship between gender and financial literacy, with significant disparities among non-owners and a more balanced distribution among Bitcoin owners.

¹² An analysis of the equality of financial literacy test scores between male Bitcoin owners and non-owners reveals that non-owners have a higher average score (2.33 out of 3) than Bitcoin owners, who score 2.1, and this disparity is statistically significant.

Table 4 further decomposes the demographic patterns among female Bitcoin owners.¹³ According to the findings, women with the lowest levels of understanding when it comes to cryptoassets are typically found to be within two particular age ranges: 18–34 and over 55. They tend to have either have ended formal schooling with a high school diploma or have a lower income. However, females who fall within the 35–55 age range, have a university degree, or earn between CAD 30k and 69k annually are more likely to exhibit a moderate level of crypto literacy. With regard to the financial literacy of female Bitcoin owners, those who are within the low literacy category are typically aged 18–34, with a high school diploma or low income. On the other hand, women in the high literacy category are aged between 35–54, have a university degree, or a high income. While the sample size is small, the results are consistent with findings from other surveys on financial literacy, which show that financial knowledge is lowest among younger age groups, and that it is correlated with educational attainment (Lusardi and Mitchell, 2011b).

Existing literature indicates that women are generally less inclined to hold risky assets and tend to be more financially risk averse than men (Almenberg and Dreber, 2015; Jianakoplos and Bernasek, 1998; Charness and Gneezy, 2012). In addition, Alonso et al. (2023) find, in the case of Spain, that reduced female participation in the crypto market is influenced by factors such as a lack of investment experience in traditional assets, a general deficiency in knowledge about cryptoassets, and a limited understanding of concepts like blockchain. Building on these insights, a recent survey report from the Ontario Securities Commission adds another layer to the story (Ontario Securities Commission, 2022). Compared with non-owners, crypto owners (holding either cryptoassets, crypto funds, or both) are more likely to hold a variety of investments, particularly individually held stocks or exchange-traded units. Another noteworthy finding is that individuals acquiring cryptoassets primarily relied on their friends, family, and colleagues as a source of information before making purchases. Notably, this reliance on personal networks is more pronounced among females.¹⁴ This interconnected narrative suggests women with a better understanding of financial concepts may have acquired their knowledge and skills in more conventional financial markets, and a desire for portfolio diversification or exposure to alternative assets might drive their decision to invest in Bitcoin. However, the specific nuances of the cryptoasset market, including its technology, decentralized nature, and unique risks, might not be as familiar to them.

¹³ Some sub-groups have a small number of observations; therefore, evidence should be interpreted with caution.

¹⁴ Balutel, Henry et al. (2022) find that engaging with a broader community of Bitcoin users increases the likelihood that an individual will own Bitcoin.

4.2 Joint analysis of crypto and financial literacy

The observed disparities in crypto and financial literacy among Bitcoin owners require a thorough examination of their interaction. Table 5 presents insights on the distribution of non-owners and Bitcoin owners based on their combined financial and crypto literacy.

A significant percentage of non-owners aware of Bitcoin tend to have poor understanding of crypto concepts, regardless of their level of financial literacy. Specifically, among non-Bitcoin-owning respondents with low crypto knowledge, 18% also have low financial knowledge, while 24% have a medium level, and 22% have a high level of financial literacy. Moreover, only 3% of individuals have both high financial and high crypto literacy.

Among Bitcoin owners, there is a diversity of literacy profiles. The share of owners with both low crypto and low financial literacy (16%) is comparable to the share with high literacy across both dimensions (15%). The complexity of the relationship between financial and crypto literacy suggests that individuals may not have uniformly applied their financial knowledge to the unique features of cryptoassets.

Table 6 presents the joint distribution of females based on their levels of both crypto and financial literacy and Bitcoin ownership. The table indicates that female participants who do not own Bitcoin also have a limited understanding of cryptoassets, irrespective of their financial literacy. Among female Bitcoin owners, a larger percentage tends to fall into the low and medium categories of crypto literacy, irrespective of their financial literacy, with only 6% demonstrating high levels in both areas.

4.3 Decomposition of gender differences in crypto and financial literacy

Bucher-Koenen et al. (2017) show a significant gender gap in financial literacy world-wide, with women being more likely than men to answer “don’t know” to financial literacy questions. To gain deeper insights into this phenomenon, we conduct a detailed analysis of the response distribution of both male and female Bitcoin owners and non-owners for each crypto and financial literacy question.¹⁵

4.3.1 Crypto literacy

¹⁵ The analysis presented here has limitations due to the small sample sizes involved in addition to sample selection. In particular, since surveyed men were much more likely than surveyed women to be Bitcoin owners, the number of women included in the analysis is lower than the number of men. With respect to the latter, comparisons between owners and non-owners should ideally consider other factors associated with the decision to own Bitcoin, e.g., income and labor force participation. While the conditional analysis in Section 4 addresses some of these limitations, a more detailed analysis is left for future work.

Figure 4a compares the distribution of responses to each crypto literacy question. The percentage of correct answers is higher among owners than non-owners, irrespective of gender. Another finding is that the true-or-false statement “Bitcoin is backed by the government” has the highest prevalence of correct answers among both male and female respondents, regardless of whether they own Bitcoin. On the other hand, the question about Bitcoin’s use of distributed ledger technology (DLT) had the lowest correct response rate for all subgroups, closely followed by the question related to the limited supply of Bitcoin.

Male Bitcoin owners in particular outperform their non-owner counterparts in the question about Bitcoin’s use of DLT, with owners answering correctly (61%) at over triple the rate (20%) of non-owners. Among women, Bitcoin owners perform best relative to non-owners on the question about the limited supply of Bitcoin, with female Bitcoin owners selecting the correct answer (42%) at nearly four times the rate of their non-owner counterparts (11%). These results confirm that Bitcoin owners are indeed more crypto literate than non-owners, irrespective of gender.

Figure 4a also reveals a gender gap in crypto literacy. Men outperformed women in all questions and across both ownership categories.

In this regard, the questions related to the limited supply of Bitcoin and DLT produced the largest gender difference in the percentage of correct answers for non-owners. Among non-owners, men answered correctly (20%) at nearly double the rate of women (11%). Among Bitcoin owners, the gender gap in response accuracy was generally consistent across the three questions, with men more likely to answer correctly than women. However, the most significant gender difference is observed in the questions related to Bitcoin’s supply, where 61% of males answered correctly, a rate 1.5 times higher than for females (42%).

Given that men correctly answer the crypto literacy questions more often than women, regardless of whether they own Bitcoin, does this also translate to fewer incorrect answers? Figure 4a shows that among Bitcoin owners, women tend to have a relatively lower percentage of correct answers and a higher percentage of incorrect answers compared with men for two of the three questions. The exception is the DLT-related question, where the share of incorrect answers is higher among males. Does this mean that women are more inclined to make an assertive guess even when they are unsure of the correct answer? Although this may be the case among Bitcoin owners, among non-owners the proportion of incorrect answers by men exceeded that of women for all questions. This is most evident in the DLT question, with men answering incorrectly (27%) at nearly double the rate of women (14%).

Notably, we find that women choose “don’t know” more frequently than men in both ownership groups and across all three crypto-related questions. This is most evident in the

distributions of answers to the DLT question showing that 32% of women select “don’t know” compared with just 13% of men. This suggests that confidence in one’s answers might influence the measurement of crypto literacy, as Bucher-Koenen et al., (2017) find when measuring financial literacy.

4.3.2 Financial literacy

Figure 4b considers gender differences in the financial literacy of Bitcoin owners and non-owners by comparing the distribution of responses to each of the Big Three questions of Lusardi and Mitchell (2014). Regardless of ownership status or gender, the question related to interest compounding has the highest percentage of correct answers, while the question measuring knowledge of inflation effects has the largest share of incorrect answers.

Nevertheless, observable gender differences are present. Among non-owners, women are less likely than men to answer financial literacy questions correctly. Similar to previous work exploring gender differences in financial literacy (Bucher-Koenen et al., 2017, 2021), the question measuring knowledge of risk diversification has a higher prevalence of “don’t know” answers, particularly among the female subgroup, with men choosing the correct answer at over 1.4 times the rate of women (65% compared with 48%).

Figure 4b shows that female Bitcoin owners correctly answer the financial literacy questions in similar proportions to their male counterparts, except for the risk diversification question. Relative to the distribution of correct answers among Bitcoin owners, the gender differences are much more pronounced among non-owners. In addition, comparing the proportions of incorrect answers reinforces the notion that female Bitcoin owners might be (at least) as financially literate as their male counterparts.

Further, Figure 4b shows that the proportion of “don’t know” answers in response to the compound interest and inflation questions is comparable between men (5% and 8%, respectively) and women (6% and 9%, respectively). However, women are more likely than men to select “don’t know” for the risk diversification question. In contrast, female non-owners appear to be less confident in their responses across all three questions.

In sum, this analysis finds that for non-owners of Bitcoin in Canada, a gender gap is prevalent in measures of financial literacy. However, female Bitcoin owners appear to be just as financially literate as their male counterparts. The absence of gender differences observed among crypto investors might also be attributed to a lower financial literacy score among male crypto owners when compared with their non-owner counterparts.

5. Conditional analysis of crypto and financial literacy

This section unravels the potential correlation between crypto and financial literacy. This investigation contributes to the discussion of Lyons and Kass-Hanna (2021). That work underscores the nascent nature of research that defines and measures digital literacy, while establishing connections to financial literacy, to understand financial behavior. Kass-Hanna et al. (2022) also delve into the combined impacts of financial and digital literacy. They construct a composite index for digital and financial literacy, revealing that both are pivotal factors in shaping positive financial behaviors and ensuring long-term financial security.

Unlike Bannier et al. (2019), who document a gender gap in Bitcoin literacy in the U.S. population by assuming that financial literacy can help explain crypto literacy, we examine the interdependencies between crypto and financial literacy for Bitcoin owners and non-owners.¹⁶ Given a possible reciprocal relationship between crypto and financial literacy – i.e., the potential for simultaneous learning in both crypto and conventional finance spheres – we employ a bivariate ordered probit model (Sajaia 2008; Greene and Hensher 2009).¹⁷

Our model assumes that there are both observed factors (such as demographic characteristics) and, importantly, unobserved factors that can affect crypto and financial literacy simultaneously. Such unobserved factors could account for traits such as confidence in answering literacy questions, risk tolerance, or experience with conventional risky assets.

Table 7 provides the joint estimation results for the crypto and financial literacy scores for surveyed Bitcoin owners (columns 2–3) and non-owners (columns 4–5), accounting for demographic characteristics, province fixed effects, and time effects. In the realm of crypto literacy, being female in the Bitcoin owner and non-owner cohorts has a negative and statistically significant effect. This suggests that women, irrespective of crypto ownership, are less likely than men to be knowledgeable about Bitcoin.

¹⁶ This departure is particularly relevant in the Canadian context, as highlighted by Balutel, Engert et al. (2022), which shows that Bitcoin owners in Canada tend to be younger and have lower financial literacy compared with non-owners.

¹⁷ Fontes et al. (2023) show that recent crypto owners reported having a retirement account less frequently than recent stock market investors. Additionally, recent crypto owners in their study said that cryptocurrency investments increased their interest in the stock market. In addition, Fujiki (2021) shows that cryptoasset owners without investment experience with conventional risky financial assets are less financially literate than both cryptoasset owners and non-owners with investment experience with conventional risky financial assets.

Shifting to financial knowledge, our findings indicate a statistically significant correlation between being female and less familiarity with financial concepts, particularly among non-owners. However, these coefficients are not statistically significant for the Bitcoin owner sub-sample. This indicates that women’s financial literacy tends to lag behind men’s, consistent with findings in the broader research literature. However, there is no evidence suggesting a significant gender-based difference in financial literacy between female and male Bitcoin owners.

We also consider other demographic characteristics that can affect crypto and financial literacy of Bitcoin owners and non-owners. In this regard, age does not consistently impact crypto and financial literacy among owners and non-owners. Bitcoin owners aged 35–54 and above 55 years old tend to have higher levels of both financial and crypto literacy, although the results show statistical significance only for the financial literacy of those over 55. Non-owners in both of these age groups tend to have lower crypto literacy but a better understanding of financial literacy. It appears that older individuals have less knowledge about the features of cryptoassets than younger non-owners. Nevertheless, if they do own cryptoassets, older respondents usually exhibit better financial literacy than their younger counterparts.

Attaining a university degree positively affects both crypto and financial literacy, irrespective of ownership status. However, while possessing a university degree positively affects crypto literacy for Bitcoin owners, this impact is not statistically significant. High-income (>70K) does not affect crypto literacy but positively affects financial literacy regardless of ownership status.

Furthermore, we document that unobserved factors can simultaneously account for both crypto and financial literacy, with a more pronounced impact on the cohort of Bitcoin owners.¹⁸ For example, if something drives an increase in financial literacy, it might also drive an increase in crypto literacy, and vice versa. Crypto owners, typically young males influenced by FoMO or peer pressure (Gerrans et al. 2023), may initially have lower financial literacy. However, it has been suggested that investing in crypto could improve their literacy and spark an interest in the stock market, further improving their financial literacy (Fontes et al. 2023). Conversely, individuals with high financial literacy and stock market experience might develop an interest in exploring cryptoassets, thereby enhancing their crypto literacy.

This exploratory work can form the basis of future empirical studies. In particular,

¹⁸ In more precise terms, both the ($athrho = 0.257$) for the Bitcoin owners subsample and the ($athrho = 0.152$) for the non-owners subsample indicate a positive correlation between the errors of the crypto and financial literacy equations. However, when considering the magnitude of the two, the value for the Bitcoin owners subsample is higher compared with that of the non-owners subsample.

accounting for selection in Bitcoin ownership would provide a more accurate comparison of the differences in crypto and financial literacy between genders among cryptoasset owners—i.e., a more “apples-to-apples” comparison. This could be accomplished by matching the two samples of Bitcoin owners and non-owners using program evaluation techniques such as propensity score matching, inverse probability weighting, or regression adjustment.

6. Discussion

In this paper, we use survey data from a nationally representative sample of Canadians to investigate participation in the cryptoasset market and its relationship with crypto and financial knowledge. Cryptoassets are complex products primarily used as investments, but their key features are sufficiently distinct from conventional assets that making informed decisions could require knowledge of concepts not typically captured by financial literacy measures (Banner et al., 2019). We use a novel measure of crypto literacy in conjunction with a measure of financial literacy to assess this perspective.

We find that Canadian Bitcoin owners are more informed than non-owners about the asset and thus have higher levels of crypto literacy. They are heterogeneous with respect to financial literacy. We find that women who own Bitcoin have similar financial knowledge as their male counterparts but score lower on crypto literacy measures. Moreover, the crypto literacy gender gap persists regardless of ownership status.

These results indicate that measuring crypto literacy can usefully complement measures of financial literacy in the context of digital asset markets with complex investment products that may be less reliant on knowledge of traditional financial concepts. Better understanding of both crypto and financial concepts, in turn, could help investors make better decisions and perhaps reduce the prevalence of FoMO as an investment motivation.

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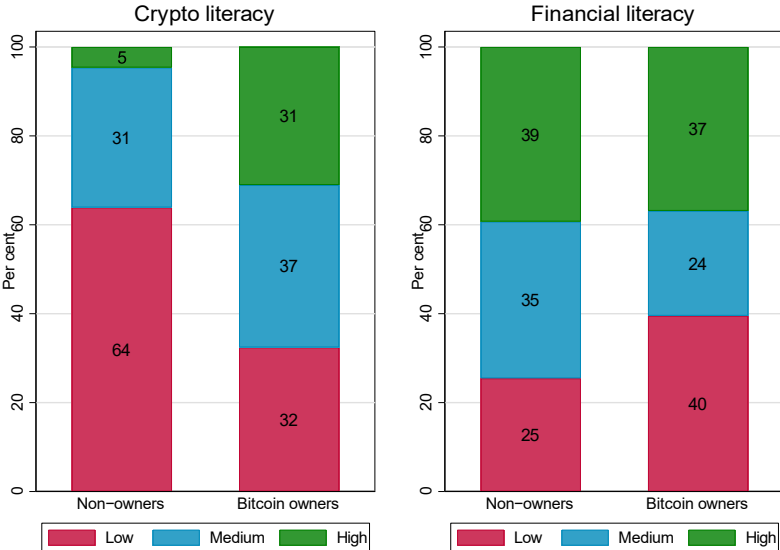
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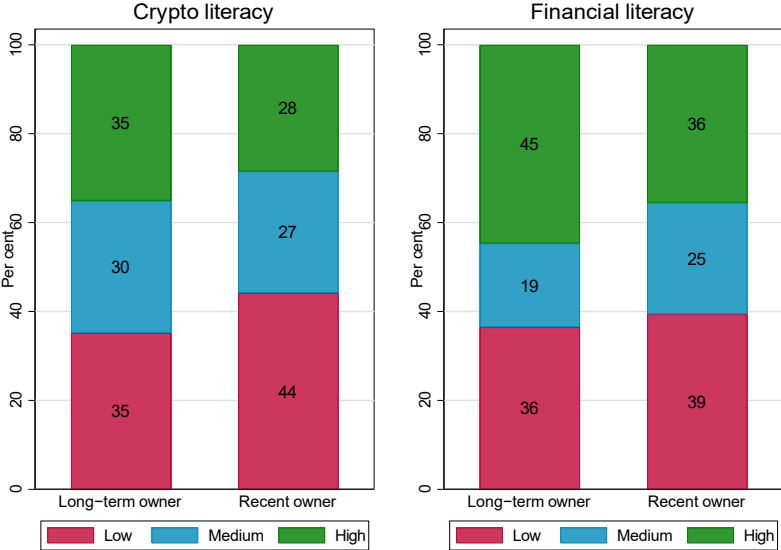
Figures

Figure 1: **Crypto and financial literacy: overall results**



Note: This figure shows the share of Bitcoin non-owners and Bitcoin owners in each category of crypto literacy (left) and financial literacy (right). Data are from the Bank of Canada’s Bitcoin Omnibus Survey. The working sample size is 1,787 in 2018, 1,745 in 2019, and 1,778 in 2021. The sample comprises 99 Bitcoin owners in 2018, 89 in 2019, and 226 in 2021. All estimates are calculated using survey weights.

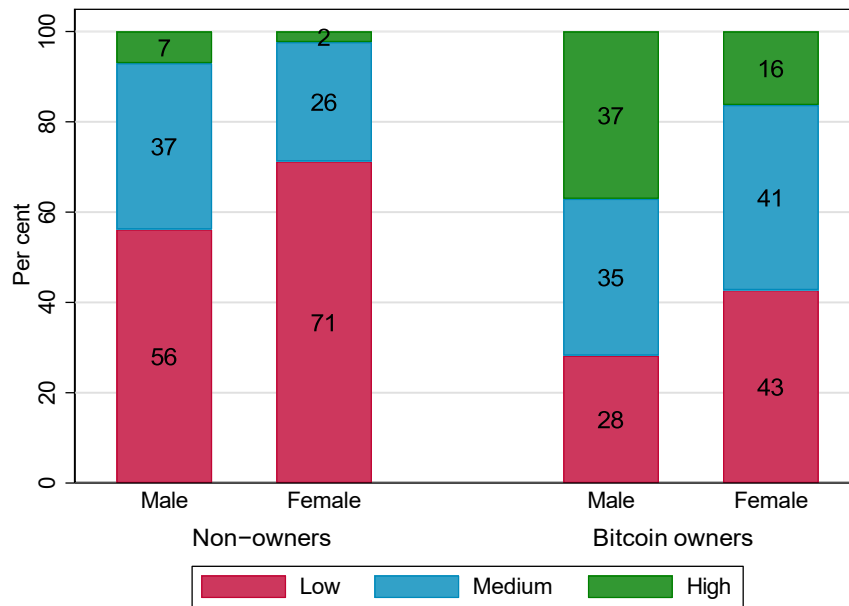
Figure 2: **Crypto and financial literacy of Bitcoin owners: long-term versus recent**



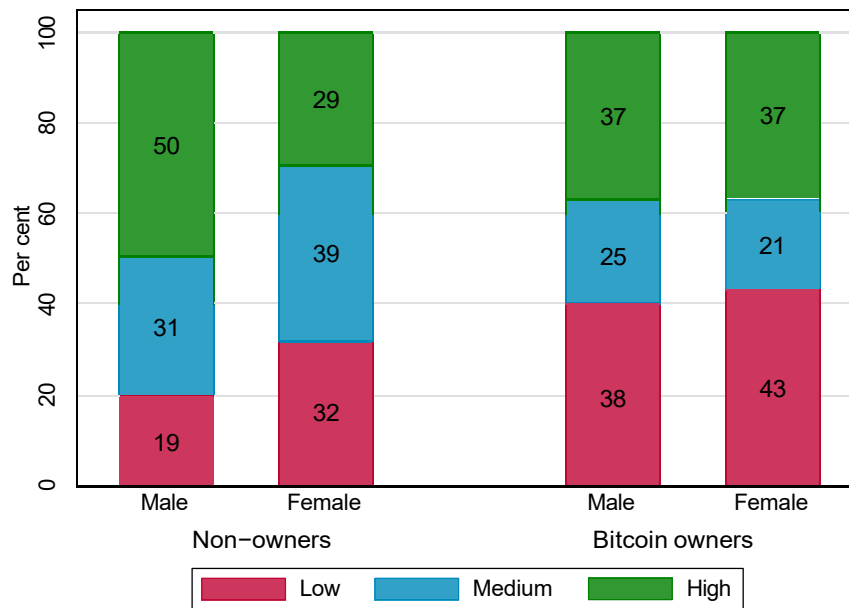
Note: This figure shows the share of long-term and recent Bitcoin owners in each category of crypto literacy (left) and financial literacy (right). Long-term owners, those who bought Bitcoin before 2020, and recent owners, who made purchases in 2020 or 2021, together form a sample of 226 (105 long-term, 121 recent). Data are from the Bank of Canada’s 2021 Bitcoin Omnibus Survey, specifically from the iteration where the question “When did you first obtain Bitcoin?” was included.

Figure 3: **Crypto and financial literacy: gender differences**

a. Crypto literacy

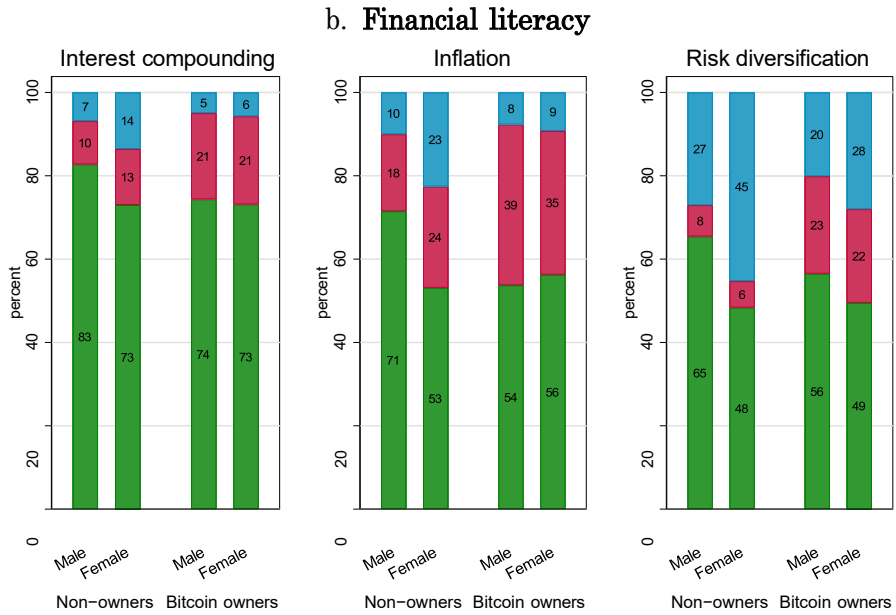
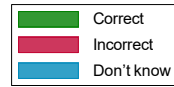
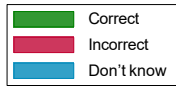
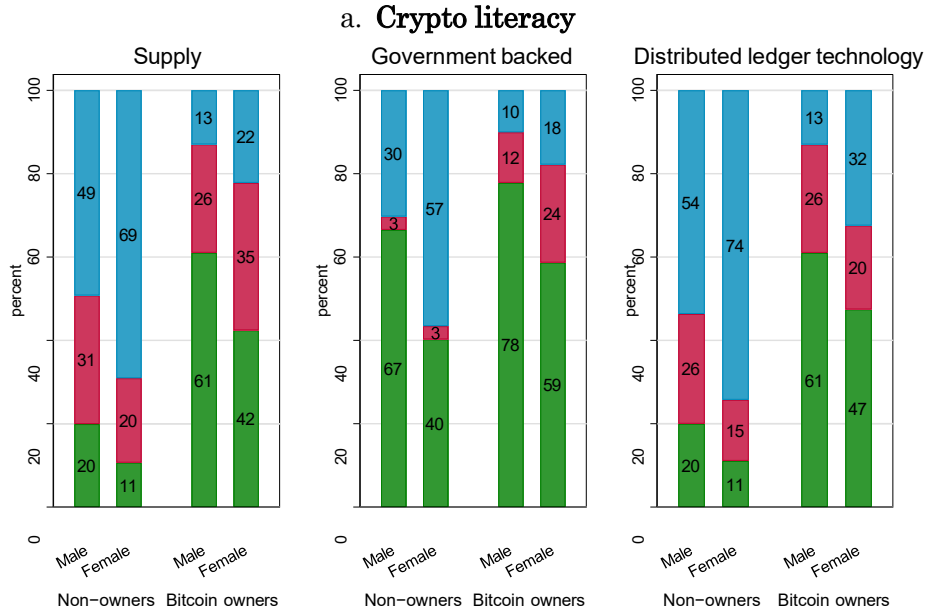


b. Financial literacy



Note: This figure shows the share of respondents in each category of crypto literacy (panel a) and financial literacy (panel b). The left side of each figure shows the distributions among non-owners of Bitcoin, categorized by gender, while the right side shows the distribution among Bitcoin owners, also categorized by gender. Categories are constructed based on scores described in Section 3.2. Years: 2018, 2019, and 2021 of the BTCOS. The sample size comprises 2,846 females, with 128 owning Bitcoin, and 2,464 males, with 286 being Bitcoin owners. All estimates are calculated using survey weights.

Figure 4: **Crypto and financial literacy: gender differences across literacy questions**





Note: Distribution of responses to crypto and financial literacy questions (see Tables 1 and 2) by gender and Bitcoin ownership. Years: 2018, 2019, and 2021 of the BTCOS. All estimates are calculated using survey weights.

Tables

Table 1: **Crypto literacy questions**

Statements	Response options
The total supply of Bitcoin is fixed.	True False Don't know
Bitcoin is backed by a government.	True False Don't know
All Bitcoin transactions are recorded on a distributed ledger that is publicly accessible.	True False Don't know

Note: This table shows the three questions (Henry et al., 2018a) used to test Bitcoin knowledge in the 2021 Bitcoin Omnibus Survey. Bitcoin is the most well-known and market-dominant cryptoasset; therefore, knowledge of these basic facts serves to measure crypto literacy. Respondents are asked to answer whether they think each statement is true or false; alternatively, they can answer "Don't know." Correct answers are shown in bold.

Table 2: **Financial literacy questions**

Questions	Response options
Suppose you had \$100 in a savings account and the interest rate was 2% per year. After 5 years, how much do you think you would have left in the account if you left the money to grow?	More than \$102 Exactly \$102 Less than \$102 Don't know
Imagine the interest rate on your savings account was 1% per year and inflation was 2% per year. After 1 year, how would much you be able to buy with this money in this account?	More than today Exactly the same Less than today Don't know
Please tell me whether or not this statement is true or false: Buying a single company's stock usually provides a safer return than a mutual fund of stocks.	True False Don't know

Note: This table shows the three financial literacy questions that were asked in the 2021 Bitcoin Omnibus Survey. Questions are taken from the "Big Three" of Lusardi and Mitchell (2014). Correct answers are in bold.

Table 3: **Demographics of Bitcoin owners by crypto and financial literacy**

	N	Crypto literacy			Financial literacy		
		Low	Medium	High	Low	Medium	High
Overall	414	0.32	0.37	0.31	0.40	0.24	0.37
Male	286	0.28	0.35	0.37	0.38	0.25	0.37
Female	128	0.43	0.41	0.16	0.43	0.21	0.37
18–34	184	0.35	0.37	0.28	0.41	0.27	0.32
35–54	166	0.28	0.39	0.32	0.45	0.16	0.39
55+	64	0.35	0.26	0.39	0.13	0.37	0.50
High School	44	0.33	0.23	0.27	0.50	0.23	0.27
College	120	0.30	0.32	0.38	0.41	0.31	0.29
University	238	0.26	0.42	0.32	0.31	0.20	0.49
<30K	40	0.33	0.47	0.20	0.56	0.28	0.17
30K–69K	128	0.26	0.37	0.37	0.36	0.33	0.31
70K+	237	0.33	0.36	0.30	0.40	0.18	0.42
Employed	331	0.31	0.34	0.34	0.35	0.27	0.38
Unemployed	83	0.32	0.37	0.31	0.41	0.22	0.37
British Columbia	58	0.39	0.26	0.36	0.27	0.28	0.44
Prairies	86	0.31	0.36	0.33	0.43	0.21	0.36
Ontario	173	0.29	0.39	0.33	0.38	0.28	0.34
Quebec	71	0.35	0.45	0.21	0.51	0.13	0.36
Atlantic	26	0.32	0.24	0.44	0.33	0.27	0.40

Note: This table reports the shares of Canadian Bitcoin owners according to their level of crypto and financial literacy. The sample consists of 414 Bitcoin owners. Years: 2018, 2019, and 2021 of the BTCOS. The Prairies region includes Alberta, Saskatchewan, and Manitoba. The Atlantic region includes New Brunswick, Nova Scotia, Prince Edward Island, and Newfoundland and Labrador. All estimates are calculated using survey weights.

Table 4: **Demographics of female Bitcoin owners by crypto and financial literacy**

	N	Crypto literacy			Financial literacy		
		Low	Medium	High	Low	Medium	High
18–34	63	0.47	0.37	0.16	0.50	0.19	0.31
35–54	50	0.35	0.50	0.15	0.37	0.20	0.44
55+	15	0.51	0.23	0.26	0.23	0.38	0.40
High School	17	0.62	0.31	0.07	0.63	0.04	0.34
College	38	0.34	0.45	0.21	0.41	0.33	0.26
University	73	0.31	0.47	0.21	0.27	0.27	0.46
<30K	14	0.70	0.05	0.24	0.89	0.06	0.05
30K–69K	43	0.34	0.52	0.14	0.46	0.35	0.20
70K+	68	0.42	0.43	0.15	0.37	0.17	0.46
Employed	96	0.41	0.40	0.19	0.57	0.24	0.19
Unemployed	32	0.43	0.41	0.16	0.39	0.20	0.41

Note: Share of female Bitcoin owners by crypto and financial literacy category. The sample size consists of 128 female Bitcoin owners. Years: 2018, 2019, and 2021 of the BTCOS. All estimates are calculated using survey weights.

Table 5: **Joint analysis of crypto and financial literacy: non-owners and owners**

		Non-owners			Bitcoin owners		
		Crypto literacy			Crypto literacy		
		Low	Medium	High	Low	Medium	High
Financial literacy	Low	18	6	1	16	15	8
	Medium	24	11	1	8	8	8
	High	22	15	3	8	13	15

Note: Share of non-owners and Bitcoin owners by crypto and financial literacy category. The sample size consists of 414 Bitcoin owners and 4,896 non-owners. Years: 2018, 2019, and 2021 of the BTCOS. All estimates are calculated using survey weights.

Table 6: Joint analysis of crypto and financial literacy: female non-owners and owners

		Female non-owners			Female Bitcoin owners		
		Crypto literacy			Crypto literacy		
		Low	Medium	High	Low	Medium	High
Financial literacy	Low	25	6	1	21	16	6
	Medium	28	10	1	10	7	4
	High	18	10	1	12	18	6

Note: Share of female non-owners and Bitcoin owners by crypto and financial literacy category. The sample size consists of 128 female Bitcoin owners and 836 female non-owners. Years: 2018, 2019, and 2021 of the BTCOS. All estimates are calculated using survey weights.

Table 7: **Conditional analysis of crypto and financial literacy**

VARIABLES	Bitcoin owners		Non-owners	
	Crypto literacy	Financial Literacy	Crypto literacy	Financial Literacy
Female	-0.612*** (0.141)	-0.049 (0.172)	-0.477*** (0.049)	-0.439*** (0.044)
35–54	0.165 (0.146)	0.018 (0.165)	-0.125* (0.067)	0.474*** (0.060)
55 +	0.006 (0.256)	0.704*** (0.232)	-0.321*** (0.067)	0.736*** (0.062)
College	0.295 (0.219)	0.106 (0.222)	0.089 (0.063)	0.313*** (0.054)
University	0.304 (0.195)	0.541** (0.227)	0.331*** (0.065)	0.748*** (0.056)
30K–69K	0.297 (0.254)	0.392 (0.277)	-0.019 (0.069)	0.322*** (0.064)
70K +	0.070 (0.256)	0.482* (0.286)	0.085 (0.071)	0.433*** (0.067)
Employed	-0.219 (0.211)	-0.140 (0.225)	0.011 (0.056)	-0.055 (0.051)
Province Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes
<i>athrho</i>		0.257*** 0.076		0.152*** 0.028
Observations		405		4,369

Note: Estimates of crypto and financial literacy scores (low, medium, and high) using a joint order probability model

(bivariate ordered probit) for Bitcoin owners subsample (Columns 2–3) and non-owners subsample (Columns 4–5). The base categories are male, aged 18 to 34 years, with high school education, low income (less than \$30,000 per year), from British Columbia and unemployed. Years: 2018, 2019, and 2021 of the BTCOS. *Athrho* represents the correlation for the two errors in the bivariate ordered probit model. All estimates are calculated using survey weights.

Appendix: 2021 BTCOS instrument

The 2021 Bitcoin Omnibus Survey (BTCOS) was completed by respondents entirely online, through the web or on mobile devices. Below is a representation of the online survey instrument. Skip logic and other programming instructions are included between square brackets but were not shown to participants. Note that demographic questions and questions related to survey recruitment were also asked but are not shown here. Please cite Balutel, Engert et al. (2022) if you wish to use these questions.

2021 BTCOS instrument

Q1. Have you heard of Bitcoin?

Yes
No

[IF 'YES' TO Q1, ASK Q1b, ELSE SKIP TO Q12]

Q1b. Please indicate whether the following statements about Bitcoin are true or false. If you are unsure, please select "don't know".

[COLUMNS]

True
False
Don't know

[ROWS: RANDOMIZE]

The total supply of Bitcoin is fixed. [True]

All Bitcoin transactions are recorded on a distributed ledger that is publicly accessible. [True]

Bitcoin is backed by a government. [False]

Q2. Do you currently have or own any Bitcoin?

Yes
No

[ASK IF Q2 = 'Yes']

Q2a. When did you first obtain Bitcoin?

[PN: DROP DOWN. SHOW 2021 to 2009]

[IF 'YES' TO Q2, ASK Q3a to Q3c, ELSE SKIP TO Q4a]

Q3a. Please tell us your main reason for owning Bitcoin.

(Select one)

[RANDOMIZE LIST]

I am interested in new technologies

It is an investment

I use it to buy goods and services on the Internet in Canada/elsewhere

I use it to buy goods and services in physical stores in Canada/elsewhere

It allows me to make payments anonymously

I use it to make remittances or other international payments

It uses secure blockchain technology to prevent loss and fraud

I do not trust banks

I do not trust the government or the Canadian dollar

My friends own Bitcoin

It is a cost saving technology, e.g. it has lower transaction fees

[ANCHOR] Other (specify)

Q3b. What is the value, in Canadian dollars, of the Bitcoin you currently own? (Please round off to the nearest dollar)

\$ [NUMERIC BOX]
Unsure/would rather not say

[IF Q3b=0, TERMINATE INTERVIEW]

Q3c. How do you obtain Bitcoin?

[RANDOMIZE LIST]

(Select all that apply)

- Cryptocurrency exchanges through a mobile app
- Cryptocurrency exchanges on a website
- Bitcoin Automated Teller Machines (ATMs)
- From a friend or family member
- Mining Bitcoin

[ANCHOR] Other, please specify [PROVIDE TEXT BOX FOR RESPONSE] [DO NOT CODE]

[IF 'NO' TO Q2, ASK Q4a - Q4c, ELSE SKIP TO Q6a]

Q4a. Have you ever owned Bitcoin in the past?

- Yes
- No

Q4b. Please tell us your main reason for [PIPE IN "not" if Q4a =no; PIPE IN "no longer" if Q4a = yes] owning any Bitcoin.

[RANDOMIZE LIST]

A price crash caused my Bitcoin to lose substantial value [SHOW IF Q4A = 'Yes'; ANCHOR]

I lost access to my personal cryptocurrency wallet [SHOW IF Q4A = 'Yes'; ANCHOR]

I cashed out my Bitcoin for a profit [SHOW IF Q4A = 'Yes'; ANCHOR]

I do not understand/know enough about the technology

It is not widely accepted as a method of payment

My current payment methods meet all my needs

The value of Bitcoin varies too much

It is not easy to acquire/use

I do not trust a private currency that is not backed by the government

I am concerned about cyber theft

I am concerned about lack of oversight from regulatory bodies

I use alternative digital currencies instead (e.g. Ethereum, Tether, Litecoin, etc.)

I do not believe the Bitcoin system will survive in the future

[ANCHOR] Other (specify)

[ASK ONLY IF Q4A = 'Yes']

Q4c. How did you previously obtain Bitcoin?

[RANDOMIZE LIST]

(Select all that apply)

Cryptocurrency exchanges through a mobile app

Cryptocurrency exchanges on a website

Bitcoin Automated Teller Machines (ATMs)

From a friend or family member

Mining Bitcoin

[ANCHOR] Other, please specify [PROVIDE TEXT BOX FOR RESPONSE] [DO NOT CODE]

[ASK Q6a IF 'YES' TO Q1]

Q6a. How likely do you think it is that the Bitcoin system will survive for the next 15 years? Please use the sliding scale where 0 means that the system will certainly fail and 100 means the system will certainly survive.

[INSERT SLIDING SCALE WITH WORD ANCHORS 0=Will certainly fail, 50=Unsure, 100=Will certainly survive] [DO NOT PUT THE NUMBER 0, 50, OR 100 WITHIN THE WORD ANCHOR BOX]

[ASK Q6b IF 'YES' TO Q1]

Q6b. What percentage of Canadians do you think will be using Bitcoin 15 years from now? Please use the sliding scale where 0 means no Canadians will be using Bitcoin and 100 means all Canadians will be using Bitcoin. [INSERT SLIDING SCALE WITH WORD ANCHORS] [DO NOT PUT THE NUMBER 0 OR 100 WITHIN THE WORD ANCHOR BOX]

[ASK Q7a – Q7c IF Q1=YES, ELSE SKIP TO Q12]

Q7a. What is the current price of Bitcoin?

Please provide your best estimate in Canadian dollars. Please round to the nearest dollar.

[INSERT NUMERIC BOX]

1 BTC = \$ ____ CAD

[SHOW Q7b AND Q7c ON SAME SCREEN]

Q7b. The price of one Bitcoin is around \$[INSERT RELEVANT PRICE EACH MORNING WHILE THE SURVEY IS IN FIELD] Canadian, as of this morning.

In one month, what do you expect the price of Bitcoin to be?

Please provide your best estimate in Canadian dollars. Please round to the nearest dollar.

[INSERT NUMERIC BOX]

1 BTC = \$ ____ CAD

Q7c. In one year, what do you expect the price of Bitcoin to be?

Please provide your best estimate in Canadian dollars. Please round to the nearest dollar.

[INSERT NUMERIC BOX]

1 BTC = \$ ____ CAD

Q8a. Please indicate whether you have heard of any of the following digital currencies.
(Select all that apply) [RANDOMIZE LIST]

- Ethereum (ETH)
- Bitcoin Cash (BCH)
- Litecoin (LTC)
- Tether (USDT)
- USD Coin (USDC)
- DAI (formerly known as Sai)
- Binance Coin (BNB)
- XRP (RIPPLE)
- Diem (formerly known as Libra)
- Polkadot (DOT)
- Dogecoin (DOGE)
- Chainlink (LINK)
- Stellar (XLM)
- Monero (XMR)
- [ANCHOR] Other digital currency (please specify) [PROVIDE TEXT BOX FOR RESPONSE] [DO NOT CODE]
- [ANCHOR] No, I have not heard of any other digital currencies

[PIPE IN RESPONSES FROM Q8a; SKIP Q8b IF THEY HAVE NOT HEARD OF ANY OTHER DIGITAL CURRENCIES]

Q8b. Do you currently own any of the following digital currencies?
(Please check all that apply) [RANDOMIZE LIST]

[DISPLAY THOSE SELECTED IN Q8a]

- [ANCHOR] Other (please specify) [PROVIDE TEXT BOX FOR RESPONSE] [DO NOT CODE]
- [ANCHOR] No, I do not hold any other digital currencies

[ASK Q9 IF Q2=YES OR Q8b = 'Tether', ELSE SKIP TO INSTRUCTIONS ABOVE Q11]

Q9. Approximately how often do you use [PIPE IN 'Bitcoin' and/or 'Tether' based on Q2 and Q8b] to pay for goods and services? (Please select the most appropriate response)
[ROWS]

- Once a week or more
- A few times a month
- Once a month
- A few times a year
- Once a year
- Less than once a year
- Never

[COLUMNS; PIPE IN BASED ON Q2 AND Q8b]

- Bitcoin
- Tether

[ASK Q9a if Q9= "Once a week or more", "A few times a month", "Once a month" OR "A few times a year"]

Q9a. What was the name of the last business or website where you used [PIPE IN 'Bitcoin' and/or 'Tether' based on Q2 and Q8b] to pay for a good or service?

[ROWS]

[TEXT BOX]

Don't know / prefer not to say

[COLUMNS; PIPE IN BASED ON Q2 AND Q8b]

Bitcoin

Tether

[ASK Q10 IF Q2=YES, ELSE SKIP TO INSTRUCTIONS ABOVE Q11]

Q10. Approximately how often do you use Bitcoin to send money to other people?

(Please select the most appropriate response)

Once a week or more

A few times a month

Once a month

A few times a year

Once a year

Less than once a year

Never

[ASK Q11 IF Q2=YES OR Q4a=YES OR Q8b≠ "No, I do not hold any other digital currencies", ELSE SKIP TO Q12]

Q11. Have any of the following incidents happened to you?

(Select all that apply) [RANDOMIZE LIST]

I lost access to my personal cryptocurrency wallet

The cryptocurrency exchange holding my funds was hacked

I experienced problems with a purchase made using cryptocurrencies

I participated in an Initial Coin Offering and it turned out to be a scam

A price crash caused my cryptocurrency to lose substantial value

My personal data held by a cryptocurrency exchanges was compromised

The cryptocurrency exchange I was using stole my funds

None of the above [EXCLUSIVE]

[ASK ALL; SHOW Q12a and Q12b on same screen]

Q12a. Thinking now about regular Canadian currency, how much cash do you currently have in your purse, wallet, or pockets? (Please round to the nearest dollar)

\$ _____

I prefer not to answer [EXCLUSIVE]

Q12b. How much cash do you currently have outside of your purse, wallet, or pockets, for example in your car, house or another safe place? (Please round to the nearest dollar)

\$ _____

I prefer not to answer [EXCLUSIVE]

Q13. Suppose you had \$100 in a savings account and the interest rate was 2% per year. After 5 years, how much do you think would have left in the account if you left the money to grow?

More than \$102

Exactly \$102

Less than \$102

Don't know

Q14. Imagine the interest rate on your savings account was 1% per year and inflation was 2% per year. After 1 year, how much would you be able to buy with this money in this account?

More than today

Exactly the same

Less than today

Don't know

Q15. Please indicate ~~whether or not~~ this statement is true or false: "Buying a single company's stock usually provides a safer return than a mutual fund of stocks".

True

False

Don't know

Q16. Switching topics, about how long do you think you will live?

I think I will live until I am...

___ years old [RANGE >CURRENT AGE TO 150]