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Private Digital Cryptoassets as Investment? Bitcoin Ownership and Use in Canada, 2016-2021

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Abstract

This report studies the dynamics of Bitcoin awareness and ownership from 2016 to 2021, using the Bank of Canada's Bitcoin Omnibus Surveys (BTCOS). In 2021, Canadians' awareness of Bitcoin remained stable at about 90%, while ownership increased to 13% from the 5% observed in 2018-2020. Canadian Bitcoin owners in 2021 were more likely to be male, aged 18 to 34 years old, with a university degree or high income. They largely see Bitcoin as an investment. A new question added to the 2021 BTCOS helps us understand the influx of investors to the Bitcoin market. Responses to this question show that roughly half of current Bitcoin owners invested during the COVID-19 pandemic (2020-2021). These recent owners differ in several ways from long-term owners. Finally, we document the broader economic context of the increase in Bitcoin ownership: widespread increases in savings and wealth by Canadian households during the pandemic, coupled with financial technology (fintech) companies providing accessible and user-friendly platforms for buying Bitcoin.

Topics: Bank notes; Digital currencies and fintech; Econometric and statistical methods
JEL codes: E4, C12, O51

Résumé

Le présent rapport examine l'évolution de la connaissance du bitcoin et de la détention de cette cryptomonnaie entre 2016 et 2021, et s'appuie sur les résultats des enquêtes-omnibus sur le bitcoin menées par la Banque du Canada. En 2021, la proportion de la population canadienne ayant entendu parlé du bitcoin est restée stable, soit à environ 90 %, tandis que la proportion détenant des bitcoins est passée à 13 %, par rapport à 5 % en 2018-2020. Les Canadiens qui possédaient des bitcoins en 2021 étaient surtout des hommes âgés de 18 à 34 ans ayant un diplôme universitaire ou un revenu élevé, et considérant le bitcoin comme un investissement. Par ailleurs, l'ajout d'une question à l'enquête-omnibus de 2021 nous aide à mieux comprendre l'affluence d'investisseurs sur le marché du bitcoin. Les réponses à cette question montrent qu'environ la moitié des détenteurs actuels le sont devenus durant la pandémie de COVID-19 (2020-2021). Nous constatons quelques différences entre ces nouveaux détenteurs et ceux de longue date. Enfin, nous présentons le contexte économique plus vaste dans lequel la détention de bitcoins a augmenté : la hausse généralisée de l'épargne et de la richesse des ménages canadiens durant la pandémie, combinée à l'introduction, par des sociétés de technologies financières, de plateformes accessibles et conviviales pour l'achat de bitcoins.

Sujets : Billets de banque; Méthodes économétriques et statistiques; Monnaies numériques et technologies financières
Codes JEL : E4, C12, O51

1 Introduction

This report analyzes Bitcoin awareness and ownership in Canada from 2016 to 2021, using the Bitcoin Omnibus Surveys (BTCOS) commissioned by the Bank of Canada and conducted by survey partner Ipsos. It follows closely on reporting of the 2019 BTCOS in Balutel et al. (2022a), providing updated results from the survey conducted in December 2021. Previous versions of the BTCOS were conducted annually from 2016 to 2018 (see Henry et al. (2018), Henry et al. (2019a) and Henry et al. (2020)). Before the 2021 BTCOS, the most recent measurements of Bitcoin awareness and ownership come from the Bank of Canada's November 2020 Cash Alternative Survey (CAS). Since that time, the price of Bitcoin has experienced notable volatility, as shown in Figure 1. Rising from $20,000 (all figures are in Canadian dollars), the price reached a then high of $75,000 in early 2021. The price then fell below $40,000 in the middle of 2021 before reaching a new high of over $80,000 by mid-November. And since the most recent survey in late 2021, Bitcoin has lost about two-thirds of its value.

Figure 2 shows that awareness of Bitcoin has remained stable at just under 90% of Canadians for the past four years. The share of Canadians who own Bitcoin, however, increased substantially between 2020 and 2021, from 5% to 13%. New features included in the 2021 BTCOS survey instrument allow us to better understand this growth in ownership. For example, the survey includes a question asking owners when they first obtained Bitcoin. This question revealed that half of current Bitcoin owners are recent adopters, purchasing Bitcoin in either 2020 or 2021. These more recent investors have somewhat different characteristics than longer-term owners who have held Bitcoin for more than two years.

The surge in Bitcoin adoption in 2020 and 2021 resulted from new owners who largely see Bitcoin as an investment. The amount of Bitcoin that recent adopters hold tends to be small, likely because of increases in the price of Bitcoin over the preceding two years. Compared with 2019, relatively more Bitcoin owners report using a mobile app to obtain their Bitcoin on exchanges, suggesting that such innovations have reduced barriers to entry. Finally, the influx of new owners has shifted the demographic makeup of Bitcoin owners. For example, Canadians with higher incomes and higher financial literacy represent a relatively larger share of Bitcoin owners compared with previous years. Overall, the results suggest that Bitcoin is becoming more clearly an investment product rather than a payment instrument.

The remainder of the paper is structured as follows. Section 2 describes the design and methodology of the 2021 BTCOS. In Section 3, we consider Canadians' awareness and ownership of Bitcoin. Section 4 discusses various characteristics and behaviours of Bitcoin owners, including awareness and ownership of crypto alternatives. Section 5 focuses on a new feature in the 2021 BTCOS that allows for distinguishing between recent and long-term Bitcoin owners. We give context to the preceding results in Section 6 by discussing the

sizable increases in savings and wealth of Canadian households in the past several years. Finally, Section 7 summarizes our findings.

2 Data

This report presents results based on data from the 2021 BTCOS, conducted in December 2021. We compare these results with those from previous iterations of the BTCOS conducted 2016-2019 and the 2020 CAS, which contained a limited set of questions on Bitcoin awareness and ownership.[1] While the methodology for conducting the BTCOS has remained largely consistent across the past several iterations, the survey instrument has been updated each time based on lessons learned, potential research questions, and, most importantly, to better understand drivers of Bitcoin adoption. The latter motivation helps to inform the Bank of Canada's view of future cash demand and to assess one of the criteria for potential issuance of Central Bank Digital Currency (CBDC) – namely, whether private digital currencies are making inroads as viable alternative payment methods.[2]

2.1 Survey instrument

The instrument used for the 2021 BTCOS can be found in Appendix A. It is based on an update of the 2019 BTCOS – see Balutel et al. (2022a), Appendix B – but includes some additional and modified questions to gain more understanding about investors in the Bitcoin market. Relevant for this paper, the key updates are as follows:[3]

- *Duration of Bitcoin ownership:* We introduced a new question asking current Bitcoin owners when they first obtained Bitcoin, the hypothesis being that recent adopters may differ in their characteristics from longer-term owners.

- *Obtaining Bitcoin:* The question about methods for obtaining Bitcoin was modified from the version introduced in 2019. Specifically, in 2021, respondents were allowed to select all methods they use to obtain Bitcoin, as opposed to identifying just their most common method.

[1] Each BTCOS from 2016 to 2019 was also conducted in the month of December. The 2020 CAS was conducted in November 2020.

[2] Bank of Canada Deputy Governor Tim Lane gave a speech on 25 February 2020, addressing two conditions under which the Bank would consider issuing CBDC: "The first is where the use of physical cash is reduced or eliminated altogether. The second is where private cryptocurrencies make serious inroads [...]". Source: https://www.bankofcanada.ca/wp-content/uploads/2020/02/remarks-250220.pdf.

[3] There are other topics covered in the survey that are not reported on here but may be used for future research, such as price expectations for Bitcoin (short- and long-term), beliefs about the future viability and popularity of Bitcoin, an objective measure of optimism, and precautionary cash holdings.

- *Bitcoin alternatives:* Building on the 2019 question about ownership of altcoins – i.e., alternatives to Bitcoin – we introduced a new question that first asks respondents whether they have heard of various altcoins. This helps streamline the ownership question, as we assume that ownership is conditional on awareness.

- *Detail on past owners:* More detail on past Bitcoin owners (those who do not currently hold Bitcoin, but did so in the past) was included in 2021. Past owners were asked how they previously obtained Bitcoin. Also, the question on stated reasons for not owning Bitcoin was modified with added response options targeted specifically to past owners.

2.2 Methodology

Both the BTCOS and CAS recruit participants from two main sources. The first is opt-in panels, that is, participants voluntarily choose to join a panel and are invited to complete various surveys in exchange for rewards. The second is internet recruitment through advertisements on websites. In this case, participants can complete an individual survey but do not have to join a panel. The goal of internet recruitment is to capture segments of the population that are harder to reach using panels, such as young men. This is especially important for studies of cryptocurrencies because young men are the most frequent owners of Bitcoin and other cryptocurrencies. The 2021 BTCOS obtained a sample composition from these sources in line with the 2019 BTCOS. Appendix C provides more detail on the sample composition and related data quality considerations.

The weighting procedure for the 2021 BTCOS follows the methodology described in Henry et al. (2019b), developed for the 2018 BTCOS. Specifically, we use a raking procedure, outlined in Deville et al. (1993), to adjust the final sample for differences between the demographic composition of our sample and the Canadian population. The procedure yields survey weights that match the sample to the 2016 Canadian Census with respect to the demographics of age, gender, region, education, marital status, employment, and household income. The obtained weights are then used to generate the results reported in this paper.

Final sample sizes of the surveys used in this report are as follows: 2016 BTCOS – 1,997 respondents with 58 Bitcoin owners; 2017 BTCOS – 2,623 respondents with 117 Bitcoin owners; 2018 BTCOS – 1,987 respondents with 99 Bitcoin owners; 2019 BTCOS – 1,987 respondents with 89 Bitcoin owners; 2020 CAS – 3,893 respondents with 181 Bitcoin owners; and, 2021 BTCOS – 1,974 respondents with 226 Bitcoin owners.

3 Bitcoin awareness and ownership

This section presents trends in Canadians' awareness and ownership of Bitcoin from 2016 to 2021, including the main demographic features of Canadian Bitcoin owners.

3.1 Canadians' awareness of Bitcoin

We measure the level of Bitcoin awareness among Canadians using the survey question, "Have you heard of Bitcoin?" The level of Bitcoin awareness increased between 2016 and 2018, from 62% to 89% of Canadians. From 2018 onward, the awareness level among Canadians remained constant at nearly 90% (see Table 1). Awareness increased among all demographic groups over the 2016 to 2021 period. Notably, Bitcoin awareness among women increased the most, from 54% in 2016 to 87% in 2021. Residents of British Columbia show the highest awareness, with 95% of residents having heard of the cryptocurrency in 2021 and over 90% aware through most of the period. Quebec residents have consistently been least likely to have heard of Bitcoin.

3.2 Canadians' ownership of Bitcoin and demographic profiles

Table 2 presents Bitcoin ownership in Canada between 2016 and 2021. The share of Canadians who own Bitcoin increased from 3% in 2016 to around 5% in 2018, which persisted in 2019 and 2020. By late 2021, however, the share of Canadians who own Bitcoin rose sharply to 13%. The demographic profile of Canadian Bitcoin owners is also presented in Table 2. We see that a larger proportion of Canadian men (19% in 2021) own Bitcoin compared with women (7%). Owners are also more likely to be relatively younger, with 26% of those 18 to 34 years old owning Bitcoin in 2021. There has also been a substantial increase in the share of those in other age groups who own Bitcoin in recent years. Notably, the percentage of Canadians 35 to 54 years old who own Bitcoin increased to 15% in 2021 from around 6% in 2020.

As regards ownership by educational attainment, investors with university education continue to have the highest ownership share (19%), but the proportion of Bitcoin owners in other education categories also increased substantially in recent years, including those with college/CEGEP/trade educations and those with high school educations.

Ownership shares increased in all income groups surveyed. Further, the distribution of ownership by income changed in 2021. More specifically, ownership rates have shifted toward middle-income and especially higher-income individuals. The share of owners in the highest-income group of Table 2 (i.e., with annual incomes of $70,000 or more) increased to 17% in 2021 compared with just over 5% in 2020, while the share of middle-income individuals

(earning between $30,000 and $69,900 per year) increased to 12% in 2021 from 5% in 2020. Bitcoin ownership increased significantly in all Canadian provinces between 2020 and 2021, and the largest increases were observed in British Columbia and Quebec. The share of Bitcoin owners in 2021 is highest in British Columbia (20%) and lowest in the Atlantic provinces (6%).

Table 2 also shows that Canadians with high financial literacy contributed to the increase in Bitcoin ownership. As a result, the ownership share of people with high financial literacy (almost 15%) is now comparable to the ownership share of people with low financial literacy (almost 16%). These results concerning ownership by financial literacy are compatible with the results of Fujiki (2020), who finds that Japanese cryptocurrency owners score higher on financial literacy questions and have more financial education compared with non-owners.

To determine whether the various demographic characteristics discussed above are influential when considered jointly, we estimate the probability of owning Bitcoin in 2021 and previous years given the various demographic characteristics available. The results are presented in Table 3. They indicate that most of the demographic characteristics remain significantly correlated with Bitcoin ownership when considered jointly. In particular, Bitcoin owners are more likely to be men, from younger cohorts, with higher incomes, employed, with low financial literacy but comparatively high knowledge about Bitcoin. The conditional analysis also confirms some changing trends in the demographic composition of Bitcoin owners. For example, both middle- and high-income categories are statistically significant in 2021, whereas they were not so previously. This indicates that middle- and high-income Canadians are more likely than their low-income counterparts in 2021 to own Bitcoin, whereas previously there was no statistically significant difference between the groups. Having high financial literacy is no longer significant in 2021 (relative to the low financial literacy category), suggesting these two groups are equally as likely to own Bitcoin, whereas previously Canadians with low financial literacy were more likely to own.

4 A deeper look at Bitcoin owners

In this section, we take a closer look at Bitcoin owners in Canada in 2021. We first report what owners know about Bitcoin relative to what the overall Canadian population knows. Next, we identify how much Bitcoin owners hold and their main reasons for owning it. This also includes a look at how often it is used to pay for goods or services, or to make person-to-person transactions. The means of obtaining Bitcoin are discussed, and then we consider Canadians' exposure to Bitcoin alternatives. We also discuss incidents that owners have faced. Finally, we discuss the cash holdings of Bitcoin owners.

4.1 Knowledge about Bitcoin

First, we analyze Canadians' knowledge about the properties of Bitcoin, exploring differences between Bitcoin owners and non-owners. The knowledge categories reported here are derived as in previous BTCOS reports (see also Appendix B). While Bitcoin knowledge among Canadian non-owners has not changed noticeably since 2018, the knowledge of Bitcoin owners in Canada has shifted over time. More specifically, the share of owners with low Bitcoin knowledge more than doubled from 19% in 2018 to 40% in 2021, see Figure 3. At the same time, the share of owners with high Bitcoin knowledge has also increased steadily from 27% in 2017 to 32% in 2021. This dichotomy reflects the fact that longer-term owners are learning and gaining more knowledge about the technology, while at the same time waves of new investors have been entering the Bitcoin market in the last few years, attracted by the rising price of Bitcoin.

4.2 How much Bitcoin do owners hold?

Starting in 2018, Bitcoin owners were asked to report the value in Canadian dollars of the bitcoins they currently hold. Figure 4 provides the resulting distribution of Bitcoin holdings from 2018 to 2021. Over this period, we see that the median holdings declined from $500 in 2018 to $250 in 2019, and then increased to $503 in 2021. These fluctuations are no doubt influenced by changing ownership patterns together with changes in the price of Bitcoin over time, particularly from 2019 to 2021 – those owning Bitcoin for longer periods of time will have seen the value of their holdings increase, while new owners may buy in at lower amounts (see Section 5 below). In 2021, over 70% of Bitcoin owners reported holding $5,000 or less.

4.3 Reasons for owning, or not owning, Bitcoin

Understanding the motivation for owning Bitcoin and how it is used in practice provides insights into the roles that cryptocurrencies play for their owners. Bitcoin owners were asked to indicate their primary reason for holding Bitcoin, and non-owners (who are aware of Bitcoin) were asked to provide their main reason for not owning Bitcoin. Table 4 presents four categories of reasons for owning Bitcoin: payments, investment, anonymity/trust, and technology. In 2021, 60% of Canadian Bitcoin owners cited investment as the most common reason for owning Bitcoin, compared with 39% in 2019. This was followed by an interest in new technology, cited by 20% of owners. Notably, only 9% of Canadians own Bitcoin in order to make payments compared with 15% in 2019. Overall, investment has dominated reported reasons for owning Bitcoin since 2017.[4]

[4]The view of cryptocurrencies functioning primarily as assets (vs payment instruments) for consumers is not new. For e.g., see Fujiki (2020) and Stix (2021).

Canadians who were aware of Bitcoin but do not currently own any were asked to select their main reason for not owning Bitcoin (Table 5). In 2021, 39% of non-owners stated that a lack of knowledge or understanding about the Bitcoin technology was their main reason for not owning Bitcoin (compared with 34% in 2019). Another 23% reported that they do not own Bitcoin because their current methods of payment already meet their needs, or that Bitcoin is not widely accepted as a method of payment. This was followed closely by 19% of non-owners who cited concerns or lack of trust-related reasons, such as that private currencies are not backed or regulated by the government. Finally, the most common reason cited by past owners in particular was that they had cashed out their Bitcoin for a profit (40% of past owners).

Starting with the 2017 BTCOS, Bitcoin owners have also been asked how often they use their Bitcoin holdings to pay for goods and services (Figure 5), and how often they use them to send money to other people (Figure 6). Most Bitcoin owners do not use their bitcoins for purchases or for person-to-person transfers. In 2021, 42% of owners reported never having used their bitcoins to buy goods and services, similar to the 44% observed in 2019. And only 35% of Bitcoin owners reported using them for purchases at least a few times a month ("often" in Figure 5). As respondents may interpret "goods and services" to mean a range of things, some of these self-reported payments likely include very specialized purchases such as NFTs or other cryptocurrencies. Similarly, in 2021, 52% of Bitcoin owners have never used Bitcoin for person-to-person transfers, the highest level for this category since 2017. By contrast, only 28% reported using their bitcoins to send money to other people "often" in 2021.

4.4 How do owners obtain Bitcoin?

In the 2019 and 2021 BTCOS, current Bitcoin owners were asked: "How do you obtain Bitcoin?"[5] New results are shown in Figure 7. We see that in 2021, 53% of current Bitcoin owners obtained bitcoins through a mobile app exchange, 47% used other web-based exchanges, and 23% used mining. The popularity of mobile and web-based methods, which have developed in recent years, suggests that these methods provide convenience and lower-cost access to Bitcoin. User figures for multiple cryptocurrency apps worldwide grew significantly in 2021, as indicated by usage data for apps provided by Coinbase, Blockchain Wallet, Crypto.com, BRD, Trust, Luno, Binance, Bitcoin Wallet, Bitcoin Wallet by Bitcoin.com, and Coinbase Wallet. For example, Blockchain.com Wallet, an app that supports

[5]The format of this question changed from 2019 to 2021 in two ways. First, respondents were constrained in 2019 to choosing their primary method for obtaining Bitcoin, i.e., they could only select one option. In 2021, they were allowed to select all methods that they have used. Second, the question in 2021 was also asked to past Bitcoin owners. In the present analysis, we focus on methods used by current Bitcoin owners for both 2019 and 2021.

Bitcoin purchases, reached over 81 million wallet users globally in 2022.[6]

4.5 Awareness and ownership of alternatives to Bitcoin

In 2021, respondents were asked to indicate if they had heard about Bitcoin alternatives,i.e., altcoins – a colloquial term for other cryptocurrencies, including stablecoins.[7] Figure 8 shows the percentage of Canadians who are aware of such altcoins, while Figure 9 reports the share of Canadians who own them. We see that 50% of Canadians have not heard of any altcoins. The most recognized altcoins are Dogecoin (28% of Canadian are aware of this coin), Ethereum (26%), Bitcoin Cash (25%) and Litecoin (14%). It is interesting to note the similar awareness levels of Dogecoin and Ethereum. Dogecoin was initially created as a joke, basing its name on a popular Internet meme. On the other hand, Ethereum was created with the idea of extending the use case of blockchain to include decentralized programmable applications (apps).[8]

Figure 9 shows ownership rates of altcoins in Canada. The most popular altcoin was Ether, owned by around 7% of Canadians. Dogecoin and Bitcoin Cash were next at 4%. Overall, 16% of Canadians owned at least one cryptocurrency (i.e., Bitcoin or an altcoin), with 10% owning both Bitcoin and altcoin(s), and 6% owning exclusively altcoins.

A question about the use of Tether, the most popular stablecoin, was also added to the 2021 BTCOS. Out of 27 owners of Tether, 40% reported that they never used Tether to buy goods and services, while 42% reported using it very often. Again, this high level of reported usage likely reflects ambiguity of the term "goods and services" used in the survey instrument, which was intended to refer to typical retail purchases. The global evidence suggests that stablecoins are not currently used for mainstream payments on a significant scale, but rather to facilitate trading in other cryptoassets for the purpose of investment. That is, stablecoins are currently used mainly to set up investments in other cryptoassets like Bitcoin. On these and related points, see Financial Stability Board (2020), Mizrach (2022), and Cecchetti and Schoenholtz (2021).

[6] Source: https://www.statista.com/statistics/647374/worldwide-blockchain-wallet-users/.

[7] We define a *stablecoin* as a medium of exchange that is (ostensibly) backed by assets held by the stablecoin issuer specifically for that purpose; i.e., to secure the value of the stablecoin typically vis-à-vis a fiat currency. In other words, a stablecoin is a liability of the issuer, which is used as a medium of exchange, and is backed by assets held by the issuer. The structure of a stablecoin is therefore distinct from cryptocurrencies like Bitcoin or Ether where no claim is made regarding backing assets.

[8] See https://en.wikipedia.org/wiki/Dogecoin and https://en.wikipedia.org/wiki/Ethereum for basic context.

4.6 Cryptocurrency risks and loss incidents: 2019 vs 2021

Studying the financial and security risks faced by Bitcoin owners can help in understanding adoption decisions and trends over time. Between 2017 and 2020, cryptocurrency fraud in Canada increased by more than 400% (Royal Canadian Mounted Police (2021)). The 2019 and 2021 BTCOS instruments asked current and past cryptocurrency owners to report whether they experienced any incidents related to price crashes, fraud or other incidents (Figure 10). In 2021, 25% of owners reported experiencing price crashes, up from 18% in 2019. Owners also reported experiencing a variety of other incidents, such as losing access to their wallets (11%), initial coin offering (ICO) scams (7%), stolen funds (7%), and data breaches (6%).

4.7 Cash holdings of Bitcoin owners

Balutel et al. (2022b) examined in detail the cash holdings of Bitcoin owners and non-owners from the 2017 and 2018 BTCOS, finding that Bitcoin owners hold substantially higher amounts of cash than non-owners even after accounting for numerous factors. Figure 19 and Table 6 show that this trend has continued in recent years. Since 2017, the BTCOS has measured cash holdings as the amount of cash held in a respondent's "wallet, purse or pocket". The median amount of cash on hand among Bitcoin owners in 2021 was $100, twice that of non-owners at $50. This actually understates the large differences in average cash on hand, driven by the heavy right tail in the distribution of cash holdings among Bitcoin owners.

5 Recent versus long-term Bitcoin owners

As noted above, there were several significant changes regarding Bitcoin ownership in Canada from 2020 to 2021, including a sharp increase in the share of Canadians who own Bitcoin. A new question introduced in the 2021 BTCOS provides more information on recent owners and how they might differ from long-term owners. In Figure 11, we see that about half of Bitcoin owners are recent, defined as first obtaining Bitcoin in 2020 (24%) or 2021 (24%). We compare this group with long-term owners, defined as those who acquired Bitcoin prior to 2020.

First, Table 7 reports the demographic characteristics of these two groups. Two margins are presented: the "between group" comparisons (rows sum to 1) show the distribution between recent and long-term owners, conditional on a given demographic group (e.g., male); the "within group" comparisons (columns sum to 1) show the distributions of various demographic categories, conditional on being either a recent or long-term owner. These two

margins provide complementary views about the influx of new Bitcoin owners in 2020 and 2021.

One of the most dynamic categories was that of older Canadians aged 55 and above: among Bitcoin owners in this age group, 68% were recent owners. However, they still account for a small share of Bitcoin owners overall, comprising 11% of recent owners and just 4.6% of long-term owners. By contrast, both men and young Canadians (aged 18 to 34) appear to be slowing down their participation in the Bitcoin market. Male Bitcoin owners skew slightly towards long-term owners (55% vs 45% recent), while young Bitcoin owners are roughly spilt 50-50. This results, for example, in women having a noticeably larger share among recent owners (33%) compared with long-term owners (24%). Finally, Table 7 also reports the results of a joint test to see if observed differences in demographic characteristics between recent and long-term owners are statistically significant. This analysis is only conclusive in showing that recent Bitcoin adopters are more likely to not be in the labour force (compared with employed). It should be noted, however, that the inherent small sample size of 226 current Bitcoin owners may hamper the ability to detect significant differences.

Next, we compare reasons for holding Bitcoin as stated by recent versus long-term owners (Figure 12). For recent owners, making payments is less important a motivation than for long-term owners. As seen before, investment is the primary motivation for recent owners and this is even more important for them compared with long-term owners. An interest in new technologies was cited by 25% of recent owners, compared with just 15% of long-term owners.

We also consider the value of Bitcoin holdings of these two groups. Recent owners tend to hold smaller amounts of Bitcoin, with 50% holding $500 worth or less compared with just 31% of long-term owners. Further, the median value of Bitcoin holdings of recent owners is $250, whereas the median value of long-term owners' Bitcoin is $2,000 (Figure 13).

There are also distinctions between these two groups with regard to Bitcoin use for purchasing goods and services (Figure 14) and making person-to-person transfers (Figure 15). The share of recent owners who never use Bitcoin for purchases is almost double that of long-term owners (55% vs 29%). Similarly, the share of recent owners who never use Bitcoin for person-to-person transfers is also much higher (65% vs 40%).

Finally, there are some unsurprising differences between recent and long-term owners with respect to their holdings of altcoins (Figure 16), their methods for obtaining Bitcoin (Figure 17), and the incidents they have faced as Bitcoin owners (Figure 18). For example, long-term owners have more experience and familiarity with the crypto market overall, and therefore we observe higher ownership of altcoins across the board. Recent owners are more likely to obtain Bitcoin via a mobile app due to the increased availability of these technologies in recent years (see Section 6), whereas long-term owners are more likely to report mining or

using a Bitcoin ATM. Finally, long-term owners have simply had more exposure to all types of potential loss incidents and, as such, report higher rates of price crashes, losing access to wallets, etc.

6 Bitcoin and asset holdings: the broader context

The dynamics of Canadian involvement in the Bitcoin market during the past two years have occurred in a particular context, which has likely contributed to the outcomes discussed above. In recent years, there has been a significant increase in the savings rate and resulting wealth of Canadians. During the pandemic, data from Statistics Canada show that the seasonally adjusted household savings rate jumped to 27%, up from a 2.4% historical average during 2015-2019.

Figure 20 shows the impact of this increased savings on household assets, including real estate holdings and financial assets. The growth in household wealth occurred in all wealth quintiles, but was most apparent among the lowest three quintiles. It also corresponded with significant increases in Canadian investment in mutual funds and securities denominated in foreign currencies (Figure 21), as well as cryptoassets (as discussed above).[9] In other words, the sharp rise in household wealth in 2020–2021 was associated with significant investment in real estate and traditional financial assets, as well as investment in cryptoassets.

The case of Wealthsimple provides some complementary insights. Wealthsimple is a Canadian financial technology (Fintech) company providing a range of financial and investment service products in an online format. Their products range from stock trading, robo-investing (i.e., algorithmic portfolio creation and re-balancing based on risk preferences), tax filing and cryptocurrency wallets. According to the Centre for Finance, Technology and Entrepreneurship, Wealthsimple had the second highest valuation among Fintech Unicorns in Canada in 2021.[10] Investment in such Fintech Unicorns in Canada exploded to an unprecedented level in 2021, reaching a total of $1.5 billion and representing a increase of two orders of magnitude compared with 2020 (Figure 22). Wealthsimple in particular has received $900 million in investment funds since its inception, the bulk of these funds coming in October 2020 ($114 million) and May 2021 ($750 million).

Figure 23 shows Google searches for "Wealthsimple crypto" along with some key milestones over 2020-2021. Wealthsimple received regulatory approval for its crypto trading platform in August 2020. Initially, only Bitcoin and Ether were available for trading on

[9] From Statistics Canada's *The Daily*: "Households capped off a year of intense mutual fund investment activity with net purchases of $39.3 billion in the fourth quarter [of 2021], breaking the previous record set only three quarters prior. Mutual fund purchases totalled $113.6 billion in 2021, well above the $53.1 billion recorded in 2020. Canadians may be looking for alternate investment opportunities with better returns."

[10] A Fintech Unicorn is defined as a late-stage startup that has a valuation of at least $1 billion.

that platform in a closed-loop system, which precluded withdrawals into external wallets. In June 2021, additional cryptoassets (coins) were added to Wealthsimple's offerings, and other coins were subsequently added regularly. Currently, Wealthsimple offers trading in 57 cryptocurrencies.[11] Near the end of 2021, the company also announced plans for *custodial wallets* with withdrawal and deposit capabilities, starting again with Bitcoin and Ether and followed by a roll-out to include other coins. This type of wallet is useful for investing on the Wealthsimple platform, but cannot be used directly for making payments. The rise of Wealthsimple represents both increased ease of access to Bitcoin and other cryptocurrencies via user-friendly website and mobile app interfaces and an increased interest in retail investing via different channels that include cryptocurrencies.

7 Conclusion

This report uses data from the Bank of Canada's Bitcoin Omnibus Survey and presents the trends in Bitcoin awareness and ownership in Canada since 2016, with particular attention to developments in 2020 and 2021. We also provide information on Canadians' awareness and ownership of altcoins. Finally, we analyze differences between recent and long-term Bitcoin investors to better understand the changes observed in recent years, including the sharp increase in ownership.

While Bitcoin awareness among Canadians has remained stable at about 90% for the past few years, the share of Canadians who own Bitcoin has increased from 5% (2018-2020) to 13% in 2021. In terms of demographics, Bitcoin owners are more likely to be men, relatively young, with a university degree or a relatively high income. Owners are also characterized by two cohorts: one with low financial literacy and one with high financial literacy. Canadian Bitcoin owners generally have small holdings and do not appear to be very interested in the payment features of Bitcoin, but instead see Bitcoin primarily as an investment.

The most common method of obtaining Bitcoin is via cryptocurrency exchanges accessed through mobile apps or websites, which appear to have increased retail investor access to this market. In 2021, the most common adverse incident Bitcoin owners faced was a price crash resulting in substantial lost value, which was reported by one-quarter of owners. Half of Canadians have heard of at least one of Bitcoin's alternatives, such as Ether, Dogecoin, or Bitcoin Cash, but holdings of such altcoins appear to be small. For example, only 7% of Canadians own Ether, and about 4% own either Dogecoin or Bitcoin Cash.

New questions added to the 2021 BTCOS provide additional information on a range of issues. Most notably, we saw that over half of all Canadian Bitcoin owners invested in Bitcoin for the first time during the COVID-19 pandemic (2020-2021). These recent investors differ

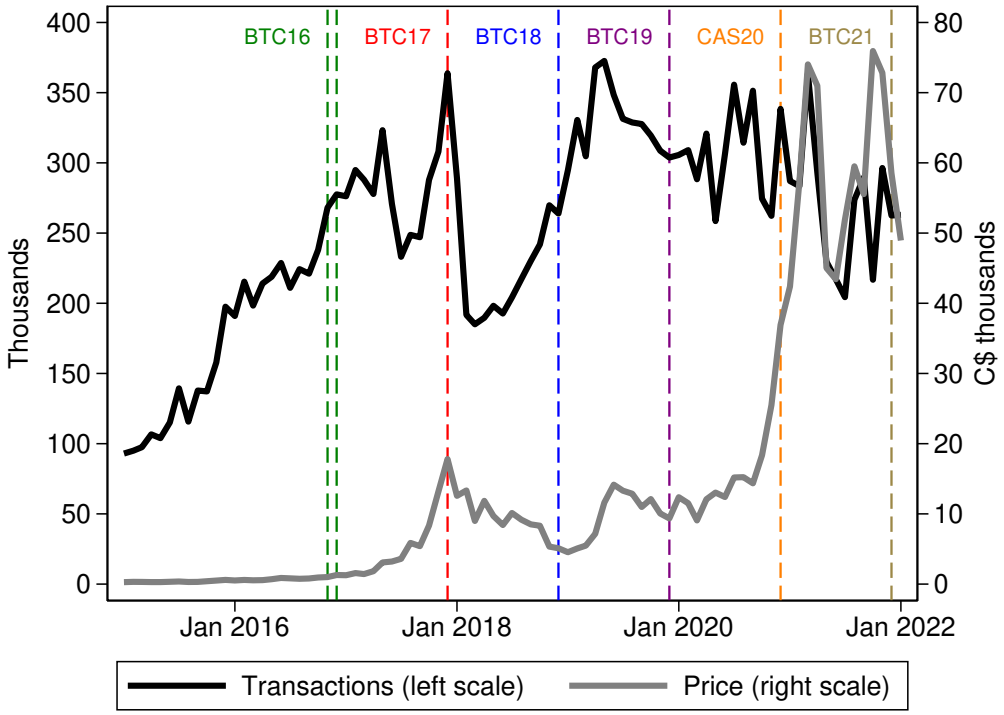
[11] This figure reflects the list of coins available to trade on Wealthsimple as of September 13, 2022.

from longer-term ones along many dimensions. For example, recent investors are even more motivated by investment reasons while holding notably smaller amounts of Bitcoin. They also tend to hold less cash than longer-term Bitcoin investors, who first acquired Bitcoin before 2020 and might value privacy more than recent investors do.

Finally, the changes seen in the crypto market and Canadians' engagement with it have taken place in the broader context of a sharp increase in household wealth in 2020 and 2021, and a corresponding increase in a range of traditional investments such as mutual funds, real estate and foreign securities, along with increased exposure to cryptoassets. Further, the latter has been supported by commercial promotion of crypto as an asset class and an improvement in retail investor access to this market.

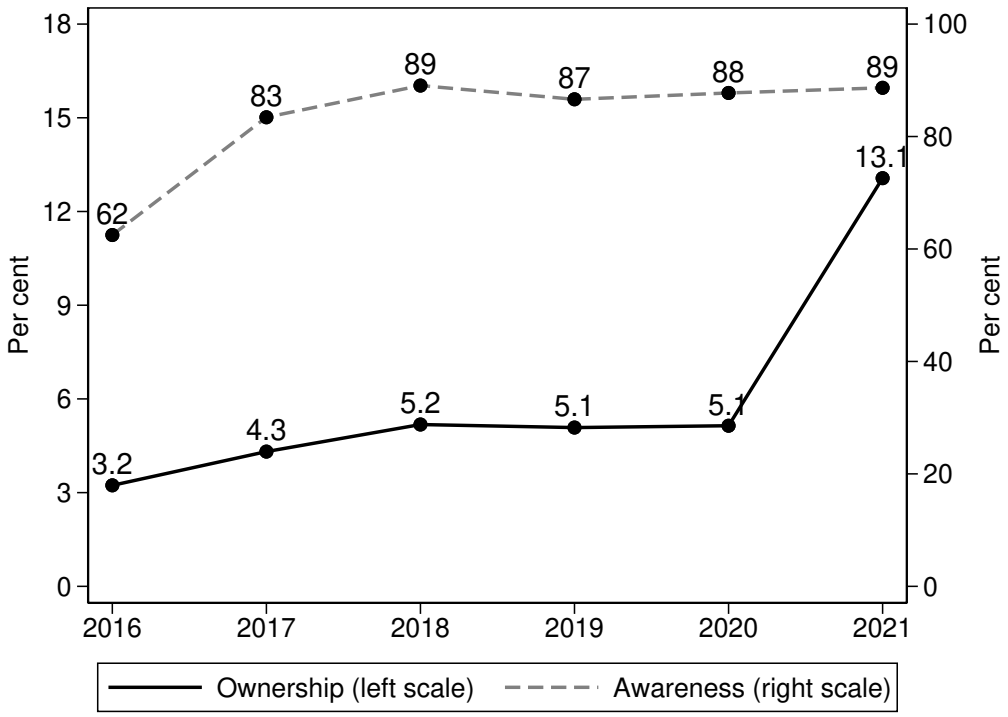
Figures

Figure 1: **Price and number of Bitcoin transactions, 2016-2021**



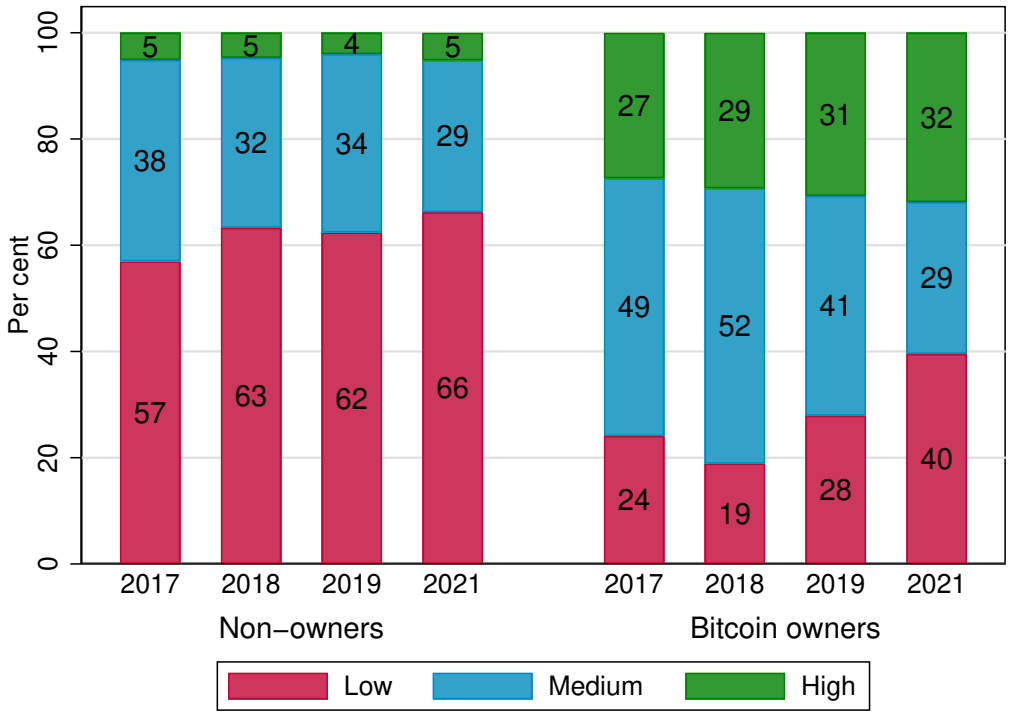
Note: This figure plots the number of transactions conducted on the Bitcoin network (left scale) as well as the price of Bitcoin in Canadian dollars (right scale), showing dates when various Bank of Canada surveys measuring Bitcoin were conducted. Green vertical lines indicate the first iteration of the Bank of Canada's Bitcoin Omnibus Survey (BTCOS), conducted initially as a pilot in two stages; the red vertical line indicates the 2017 BTCOS; the blue vertical line indicates the 2018 BTCOS; the purple line indicates the 2019 BTCOS; and the brown line indicates the most recent 2021 BTCOS. The orange vertical line represents the Bank of Canada's Cash Alternative Survey (CAS) conducted in November 2020, which contained a limited number of questions about Bitcoin awareness and ownership.

Figure 2: **Bitcoin awareness and ownership, 2016–2021**



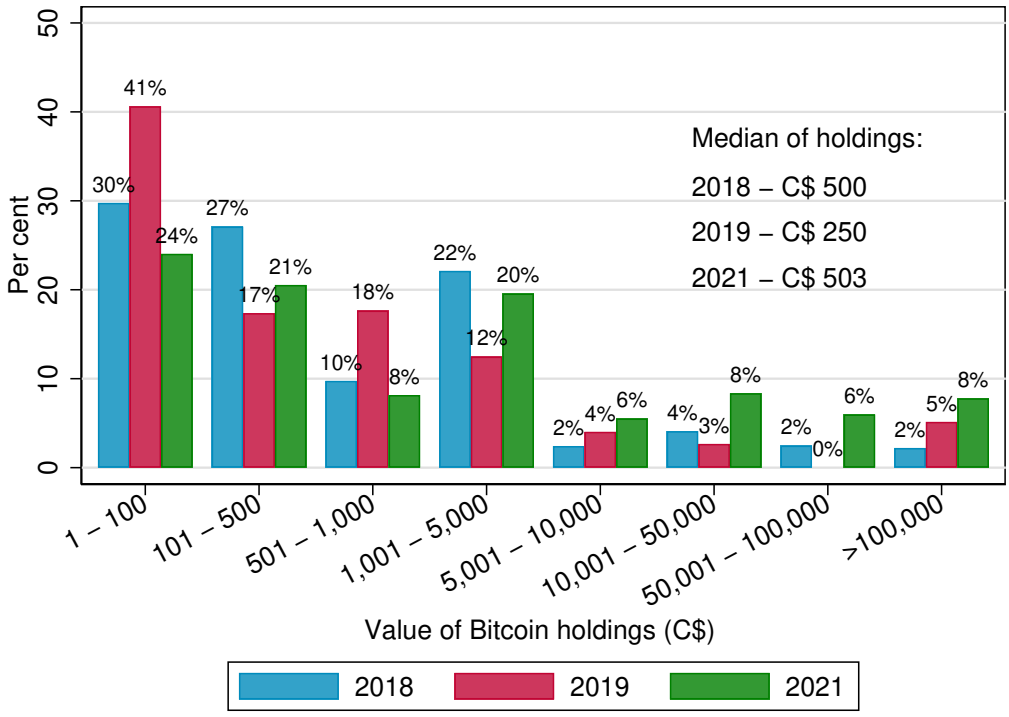
Note: This figure plots yearly estimates of the share of Canadians who were aware of Bitcoin and who owned Bitcoin from 2016 to 2021. Estimates from 2016-2019 and 2021 are from the Bitcoin Omnibus Survey; the 2020 estimates are from the Cash Alternative Survey. For ease of presentation, ownership is scaled from 0% to 18% (left scale), while awareness is scaled from 0% to 100% (right scale).

Figure 3: **Bitcoin knowledge of Bitcoin owners and non-owners, 2017-2021**



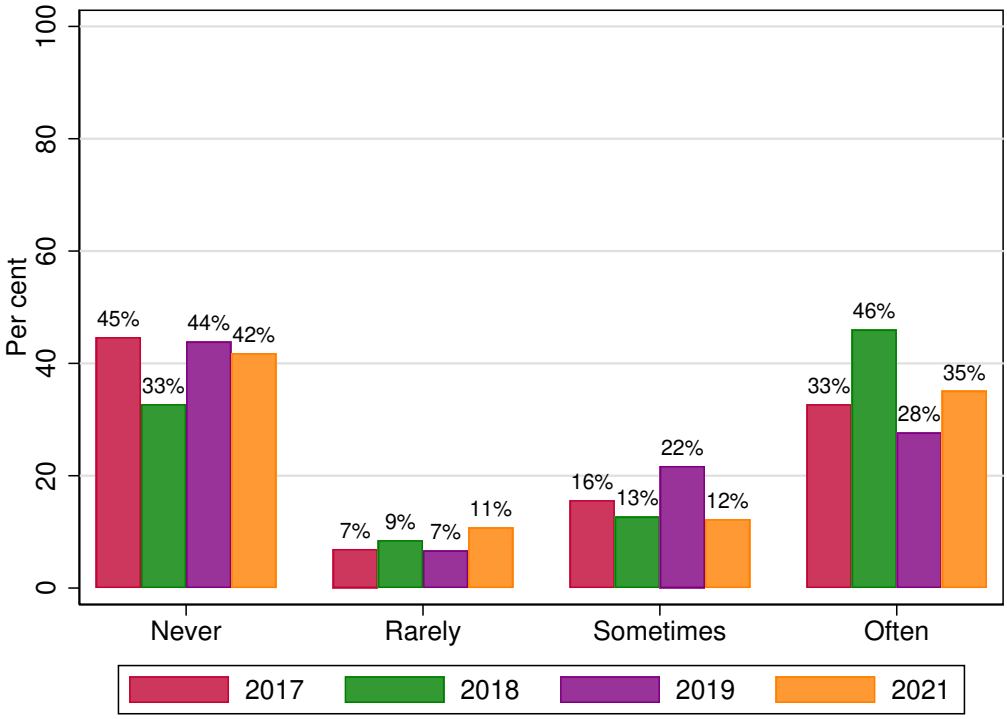
Note: This figure shows the share of Canadians in each category of Bitcoin knowledge over the period 2017-2021 (omitting 2020 when the BTCOS was not conducted). The left panel shows the distributions among non-owners, while the right panel shows the distribution among Bitcoin owners. Bitcoin knowledge categories are based on responses to three questions developed specifically for the BTCOS about the functioning of the Bitcoin system (see Appendix B for details).

Figure 4: **Bitcoin holdings, 2018–2021**



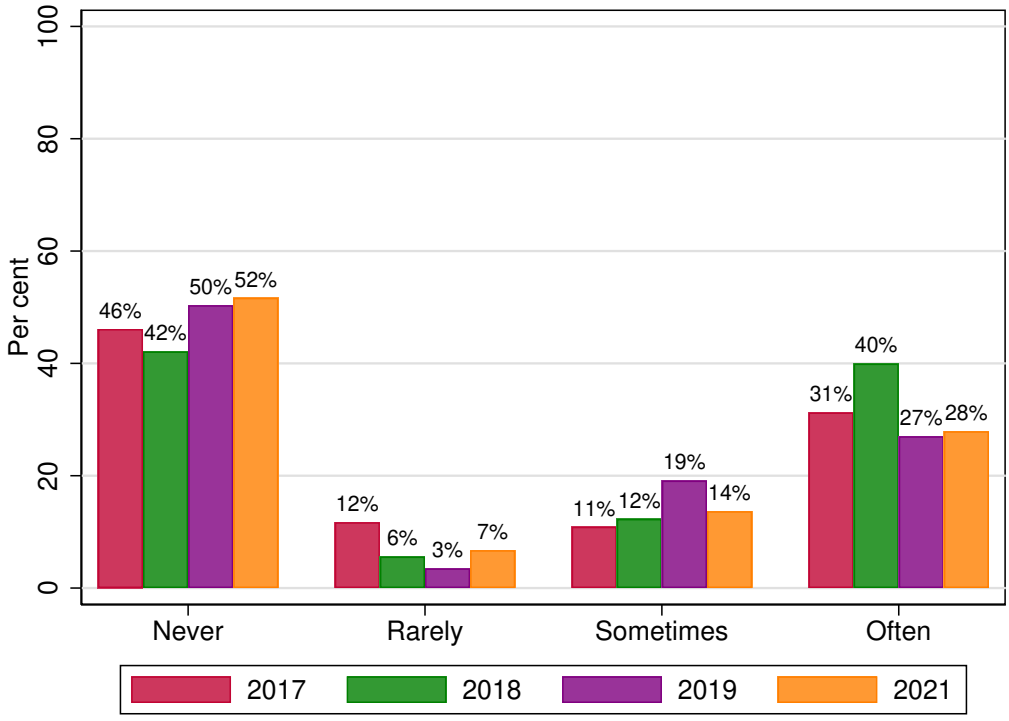
Note: In 2018, 2019, and 2021, Bitcoin owners were asked to report their holdings on a continuous range denominated in Canadian dollars. The sample consists of 99 Canadians aged 18 or older who reported that they owned Bitcoin in 2018, 89 in 2019, and 226 in 2021. All estimates are calculated using survey weights.

Figure 5: **Use of Bitcoin for buying goods and services, 2017-2021**



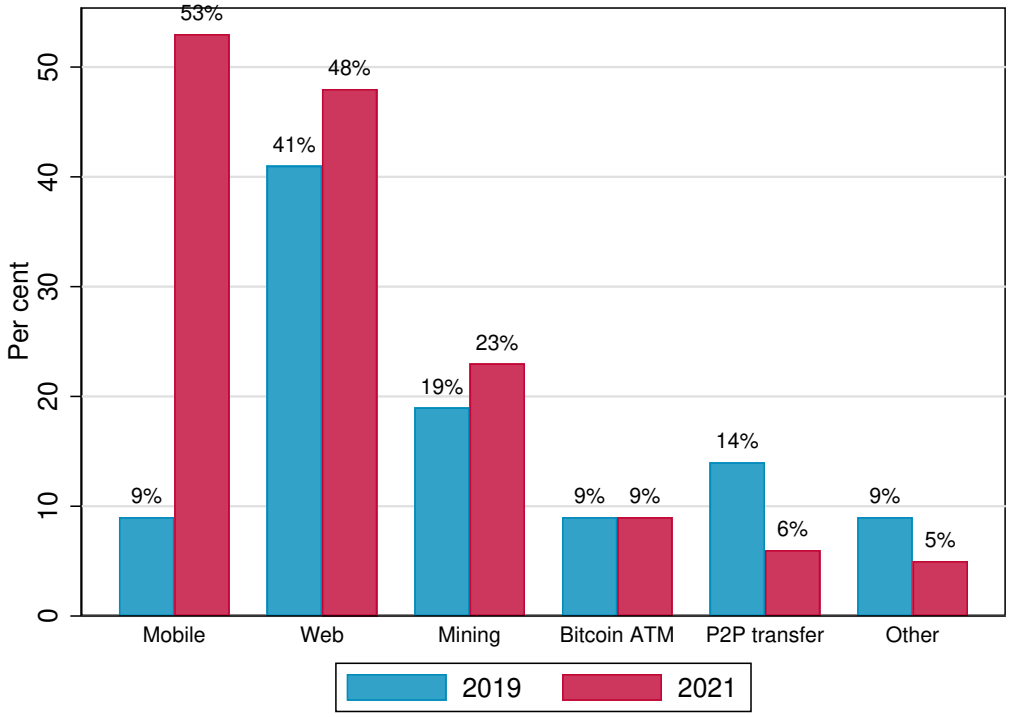
Note: This figure shows the percentages of Bitcoin owners according to how often they use Bitcoin to "pay for goods and services." Categories are defined as follows: "Never" – have never used Bitcoin for this purpose; "Rarely" – used Bitcoin once a year; "Sometimes" – used Bitcoin between a few times a year to once a month; "Often" – used Bitcoin at least a few times a month. The sample consists of 117 Bitcoin owners in 2017, 99 in 2018, 89 in 2019, and 226 in 2021. All estimates are calculated using survey weights.

Figure 6: **Use of Bitcoin for person-to-person transfers, 2017-2021**



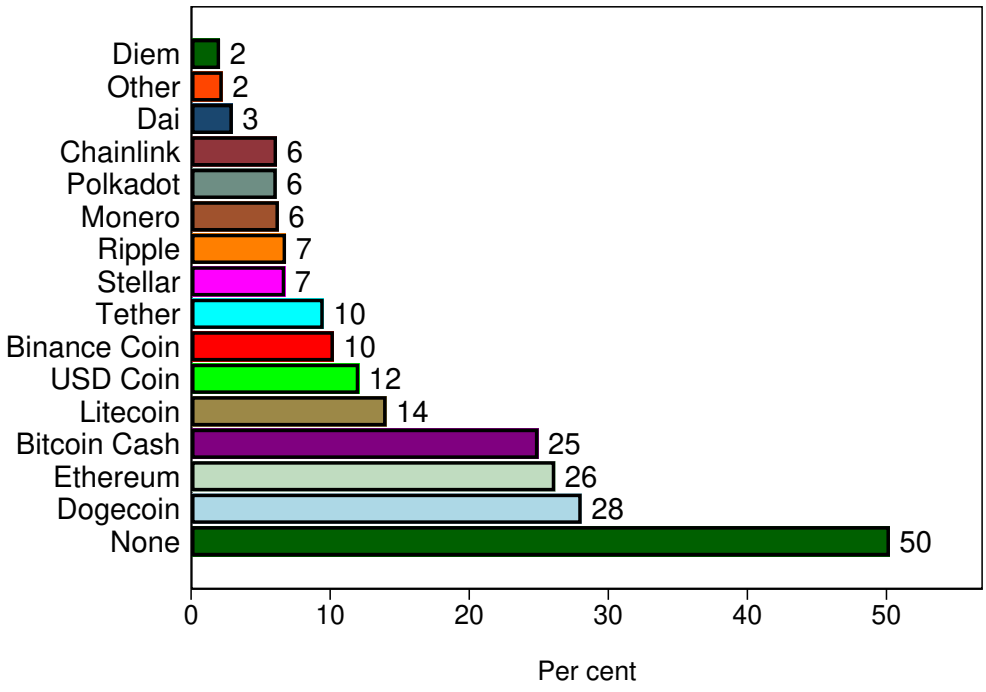
Note: This figure shows the percentages of Bitcoin owners according to how often they use Bitcoin to "send money to other people." Categories are defined as follows: "Never" – have never used Bitcoin for this purpose; "Rarely" – used Bitcoin once a year; "Sometimes" – used Bitcoin between a few times a year to once a month; "Often" – used Bitcoin at least a few times a month. The sample consists of 117 Bitcoin owners in 2017, 99 in 2018, 89 in 2019, and 226 in 2021. All estimates are calculated using survey weights.

Figure 7: **Methods for obtaining Bitcoin: current Bitcoin owners, 2019 and 2021**



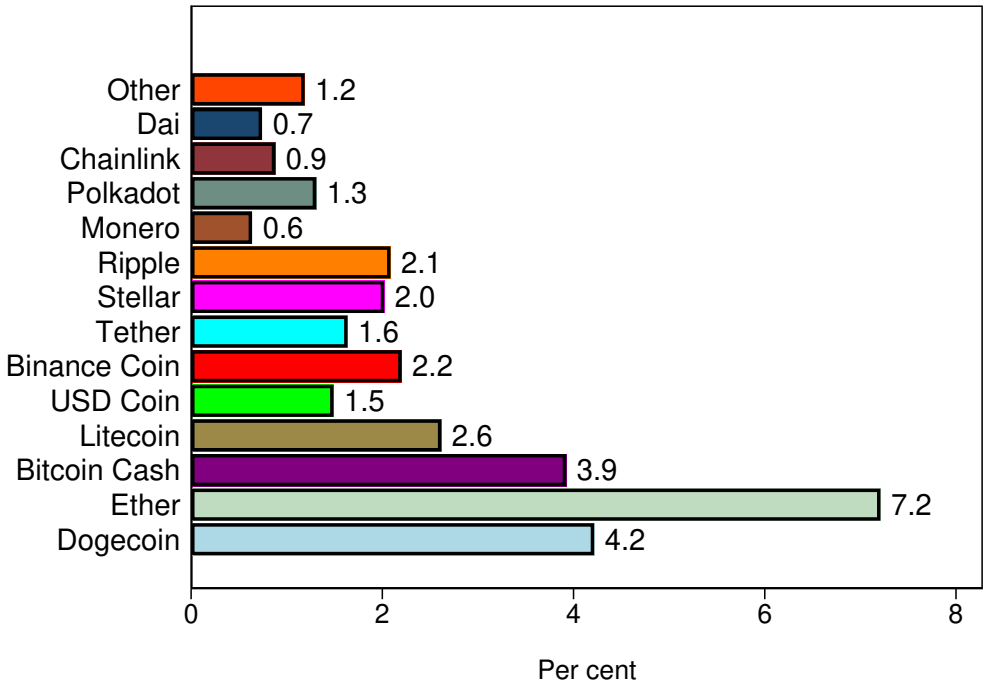
Note: This figure reports the percentages of current Bitcoin owners who obtained Bitcoin using each indicated method. "Mobile" refers to a mobile app and "Web" refers to a cryptocurrency exchange on a website. The sample consists of 89 Canadians aged 18 or older who reported they owned Bitcoin in 2019, and 226 in 2021. In 2019, respondents were asked to choose the "main" method they used (i.e., they could only select one option), whereas in 2021 respondents could "select all" methods they have used. Therefore, the reader should be cautious when comparing the figures across time. All estimates are calculated using survey weights.

Figure 8: **Altcoin awareness, 2021**



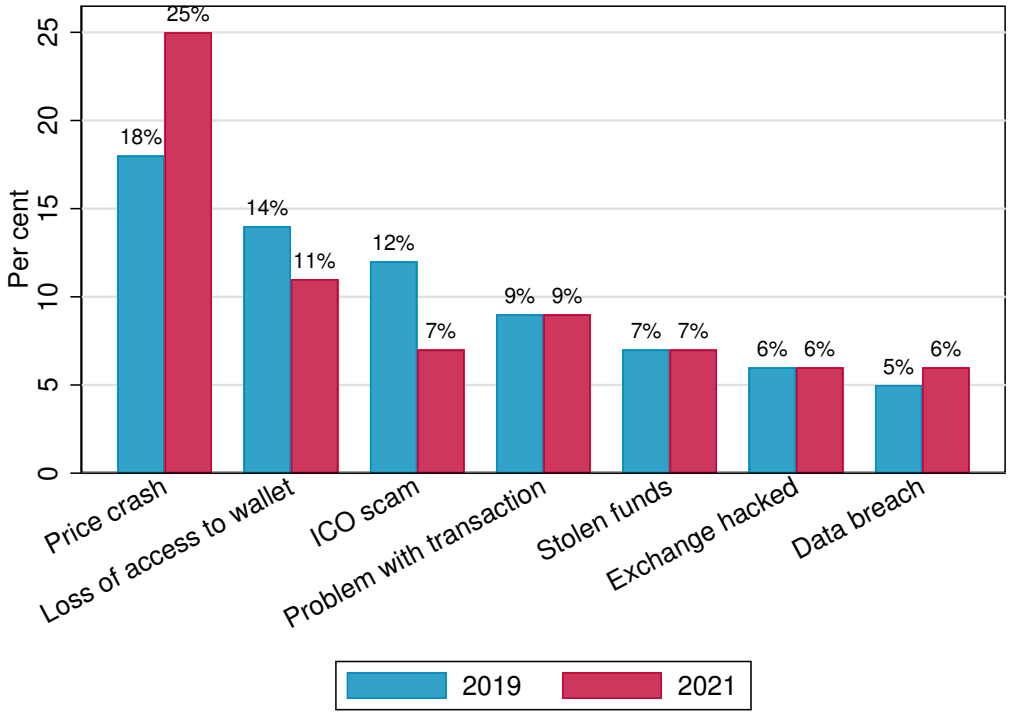
Note: This figure reports the percentages of Canadians who were aware of alternative cryptocurrencies in 2021. The sample consists of 1,974 Canadians aged 18 or older who completed the 2021 BTCOS, with 952 having heard of at least one of Bitcoin's alternatives. All estimates are calculated using survey weights.

Figure 9: **Altcoin ownership, 2021**



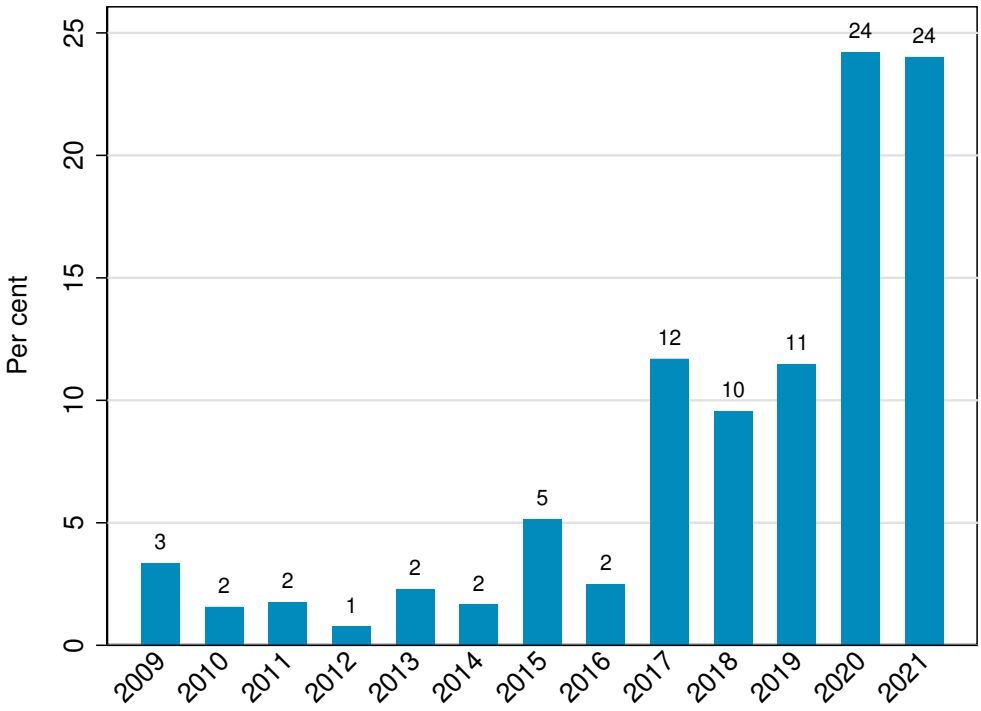
Note: This figure reports the percentages of Canadians who owned alternative cryptocurrencies in 2021. The sample consists of 1,974 Canadians aged 18 or older who completed the 2021 BTCOS. Overall, 16% of Canadians owned at least one altcoin, with 10% also owning Bitcoin and 6% owning exclusively altcoin(s). All estimates are calculated using survey weights.

Figure 10: **Cryptocurrency risks and loss incidents, 2019 and 2021**



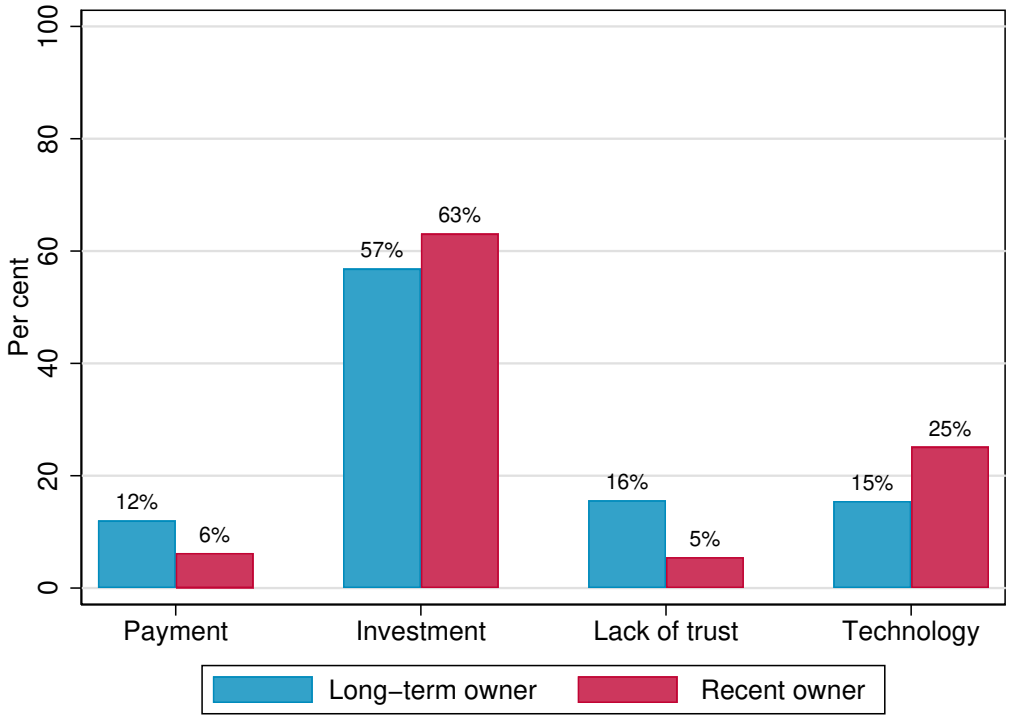
Note: This figure reports the percentages of cryptocurrency owners who experienced any of the indicated incidents from the 2019 and 2021 BTCOS. The sample consists of 177 Canadians aged 18 and over who indicated owning Bitcoin (currently or in the past) or any altcoin in 2019, and 368 in 2021. All estimates are calculated using survey weights.

Figure 11: **Longevity of Bitcoin ownership, 2021**



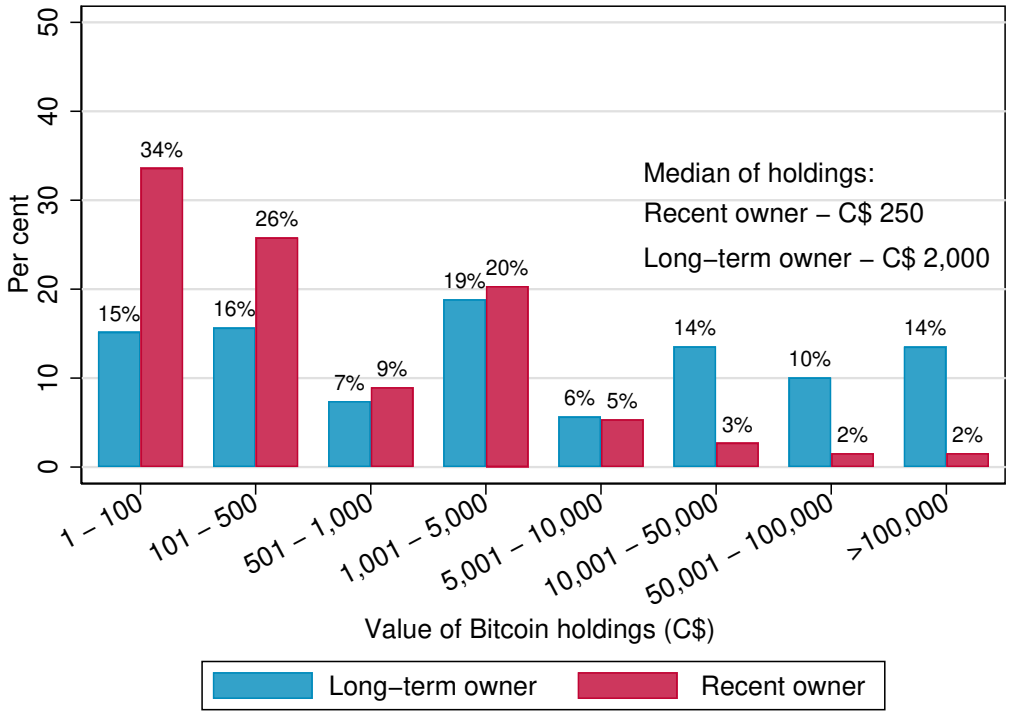
Note: This figure reports the percentages of Bitcoin owners by the year they first acquired Bitcoin. The sample includes all 226 current Bitcoin owners identified in the 2021 BTCOS. We refer to recent owners as those who acquired Bitcoin in 2020 or 2021, and long-term owners as those who acquired Bitcoin prior to 2020. All estimates are calculated using survey weights.

Figure 12: **Reasons for holding Bitcoin in 2021: recent versus long-term owners**



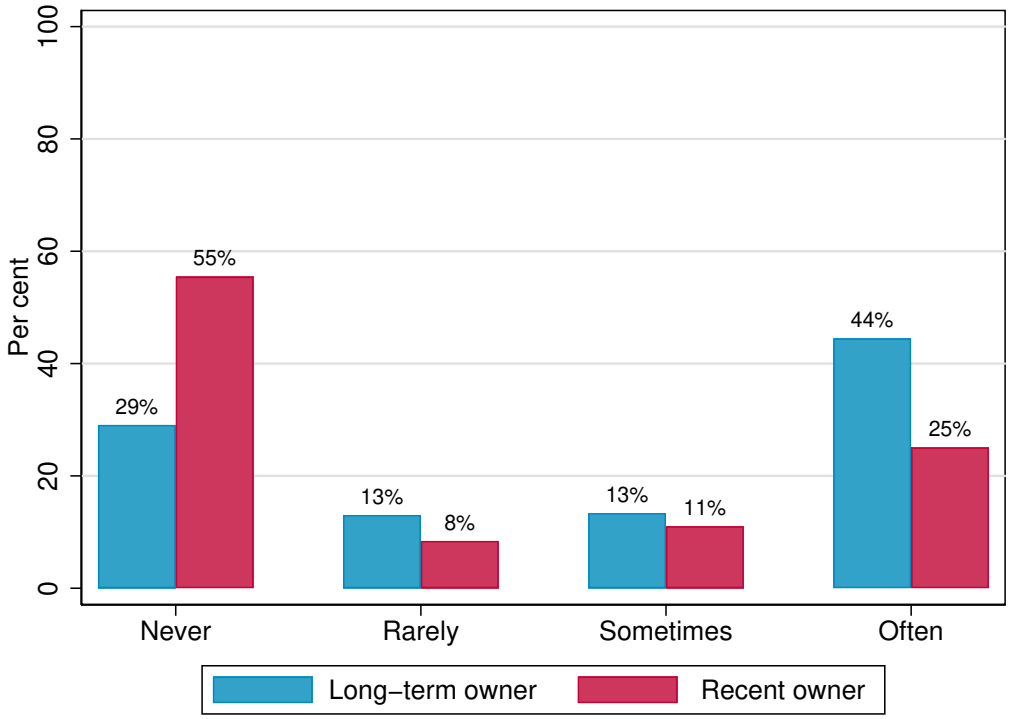
Note: This figure reports the percentages of Bitcoin owners by their stated motivation for owning Bitcoin, and broken down into two groups: recent owners (121 observations, red) are those who acquired Bitcoin in 2020 or 2021, and long-term owners (105 observations, blue) are those who acquired Bitcoin prior to 2020. The four categories on the bottom axis correspond to those in Table 4, but for the sake of presentation we have chosen abbreviated labels. All estimates are calculated using survey weights.

Figure 13: **Holdings of Bitcoin in 2021: recent versus long-term owners**



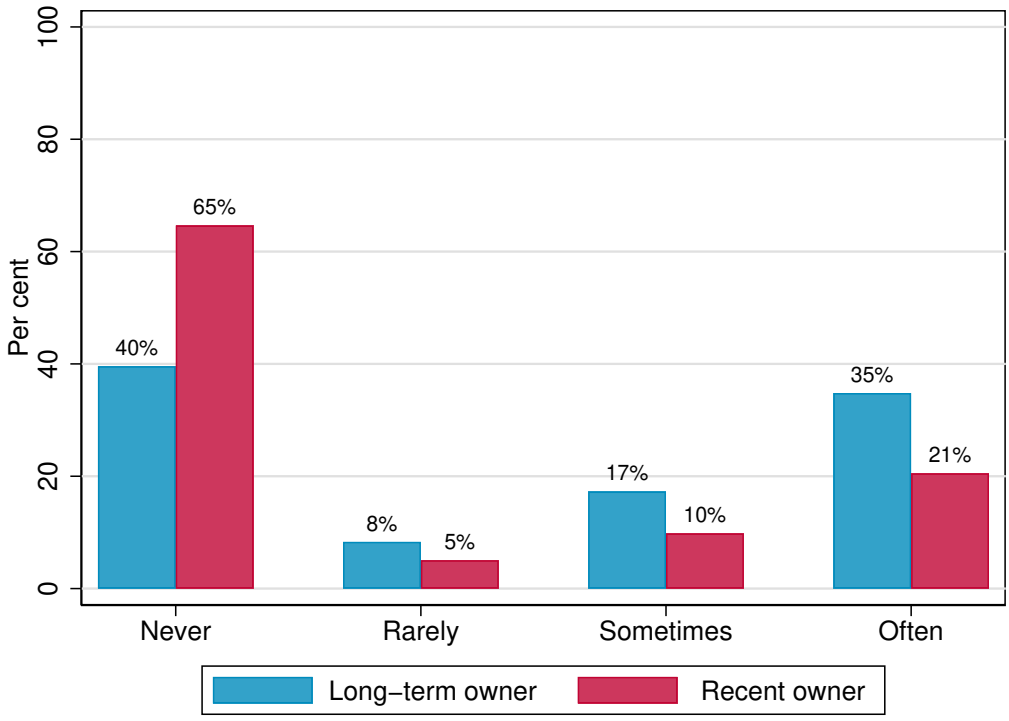
Note: This figure reports the percentages of Bitcoin owners by their holdings in Canadian dollars, and broken down into two groups: recent owners (121 observations, red) are those who acquired Bitcoin in 2020 or 2021, and long-term owners (105 observations, blue) are those who acquired Bitcoin prior to 2020. All estimates are calculated using survey weights.

Figure 14: **Buying goods and services with Bitcoin in 2021: recent versus long-term owners**



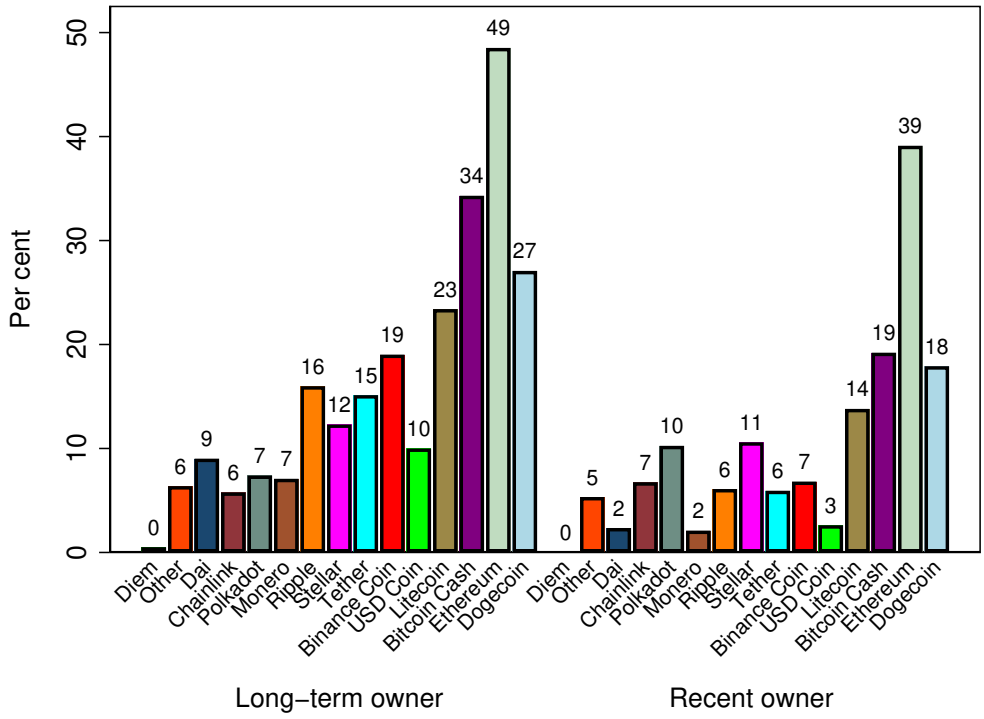
Note: This figure reports the percentages of Bitcoin owners by their stated payment behaviour using Bitcoin, and broken down into two groups: recent owners (121 observations, red) are those who acquired Bitcoin in 2020 or 2021, and long-term owners (105 observations, blue) are those who acquired Bitcoin prior to 2020. All estimates are calculated using survey weights.

Figure 15: **Person-to-person transfers with Bitcoin in 2021: recent versus long-term owners**



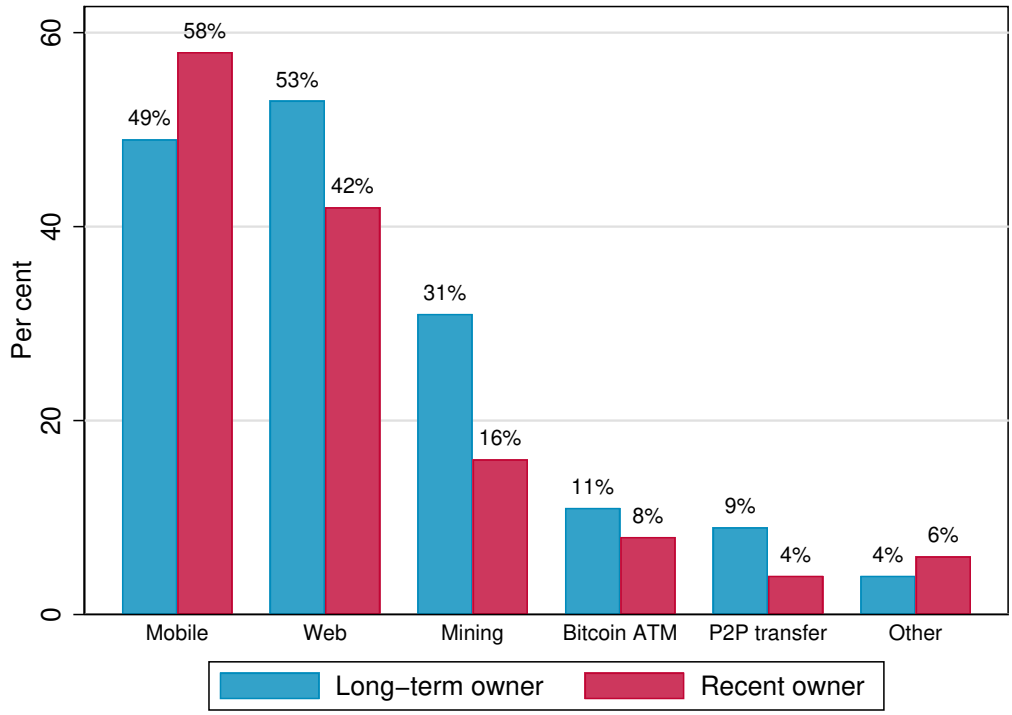
Note: This figure reports the percentages of Bitcoin owners by their stated behaviour with respect to using Bitcoin to send money to other people, and broken down into two groups: recent owners (121 observations, red) are those who acquired Bitcoin in 2020 or 2021, and long-term owners (105 observations, blue) are those who acquired Bitcoin prior to 2020. All estimates are calculated using survey weights.

Figure 16: **Ownership of altcoins in 2021: recent versus long-term owners**



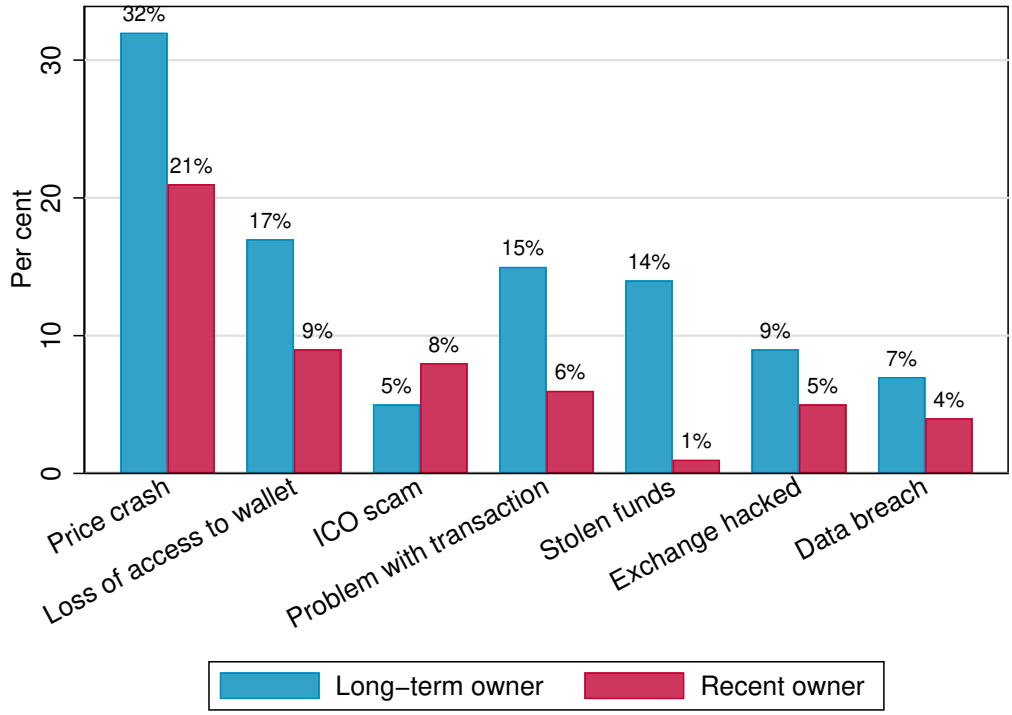
Note: This figure reports percentages of altcoin ownership among current Bitcoin owners in 2021, broken down by recent owners (121 observations, left panel) and long-term Bitcoin owners (105 observations, right panel).

Figure 17: **Methods for obtaining Bitcoin in 2021: recent versus long-term owners**



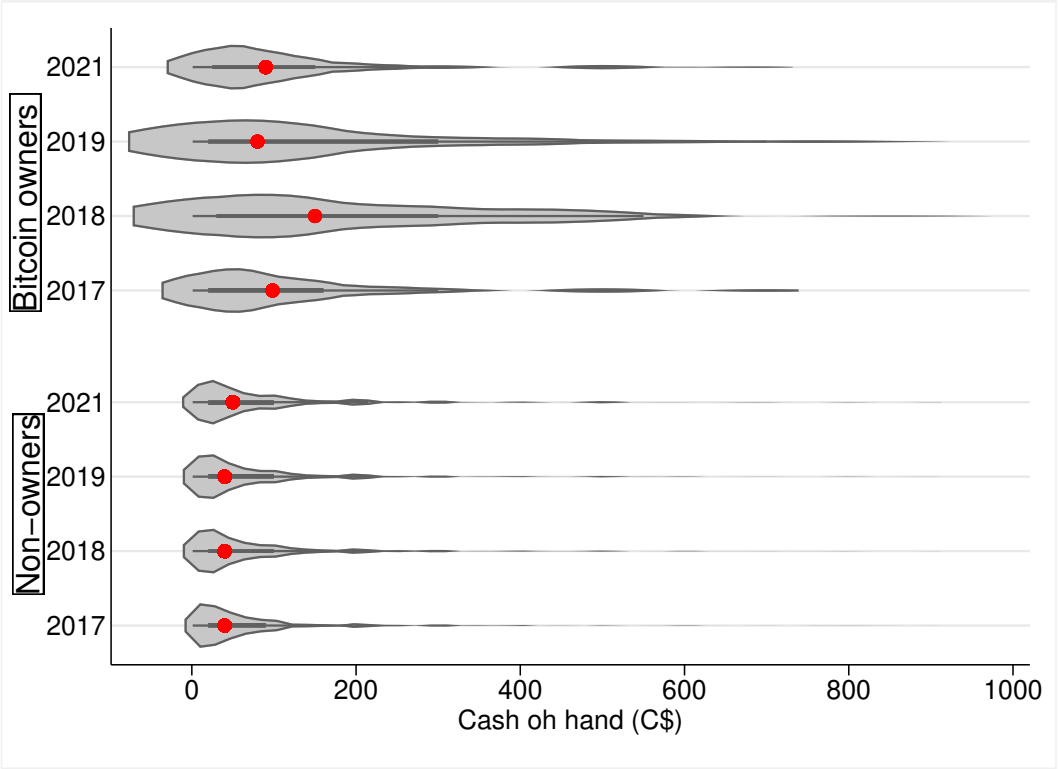
Note: This figure reports the percentages of Bitcoin owners who report obtaining Bitcoin via the indicated methods, and broken down into two groups: recent owners (121 observations, red) are those who acquired Bitcoin in 2020 or 2021, and long-term owners (105 observations, blue) are those who acquired Bitcoin prior to 2020. All estimates are calculated using survey weights.

Figure 18: **Loss incidents faced by Bitcoin owners in 2021: recent versus long-term owners**



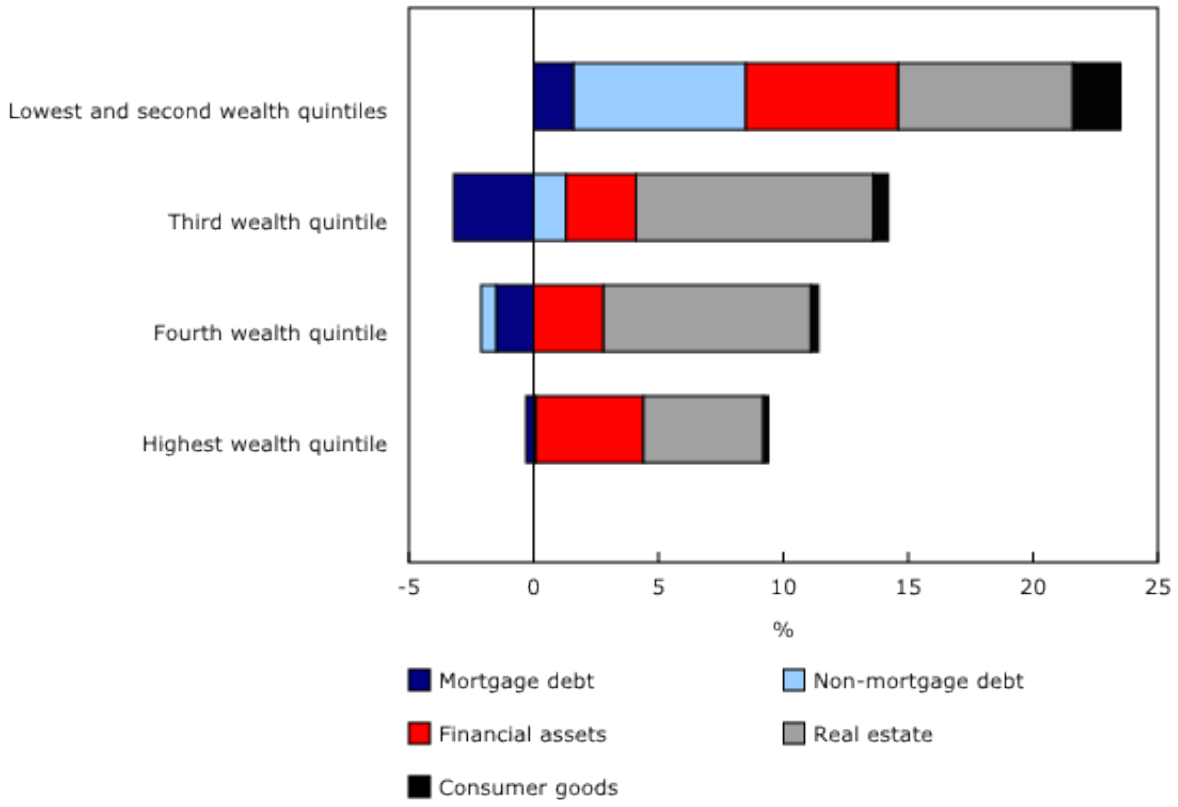
Note: This figure reports the percentages of Bitcoin owners who report experiencing the indicated incidents, and broken down into two groups: recent owners (121 observations, red) are those who acquired Bitcoin in 2020 or 2021, and long-term owners (105 observations, blue) are those who acquired Bitcoin prior to 2020. All estimates are calculated using survey weights.

Figure 19: **Cash on hand and Bitcoin ownership in Canada**



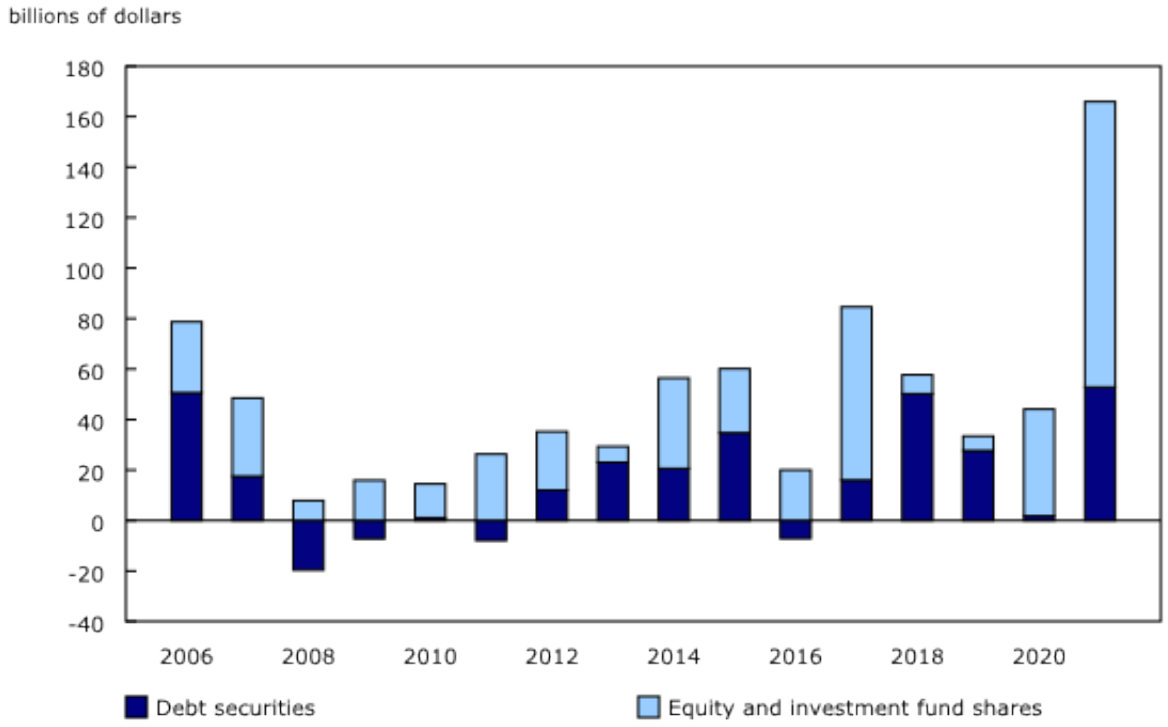
Note: This figure is called a *violin plot* of cash on hand for Bitcoin owners and non-owners over the period 2017-2021. Cash on hand is defined as the reported amount of cash in a respondent's "wallet, purse or pocket". For each year and ownership category, the violin plot shows the distribution of cash on hand estimated via kernel density (in grey) – i.e., the vertical grey height indicates the amount of people in the sample holding the given amount of cash. The red dot indicates the median value of cash on hand.

Figure 20: **Increased wealth of Canadian households, 2019-2020**



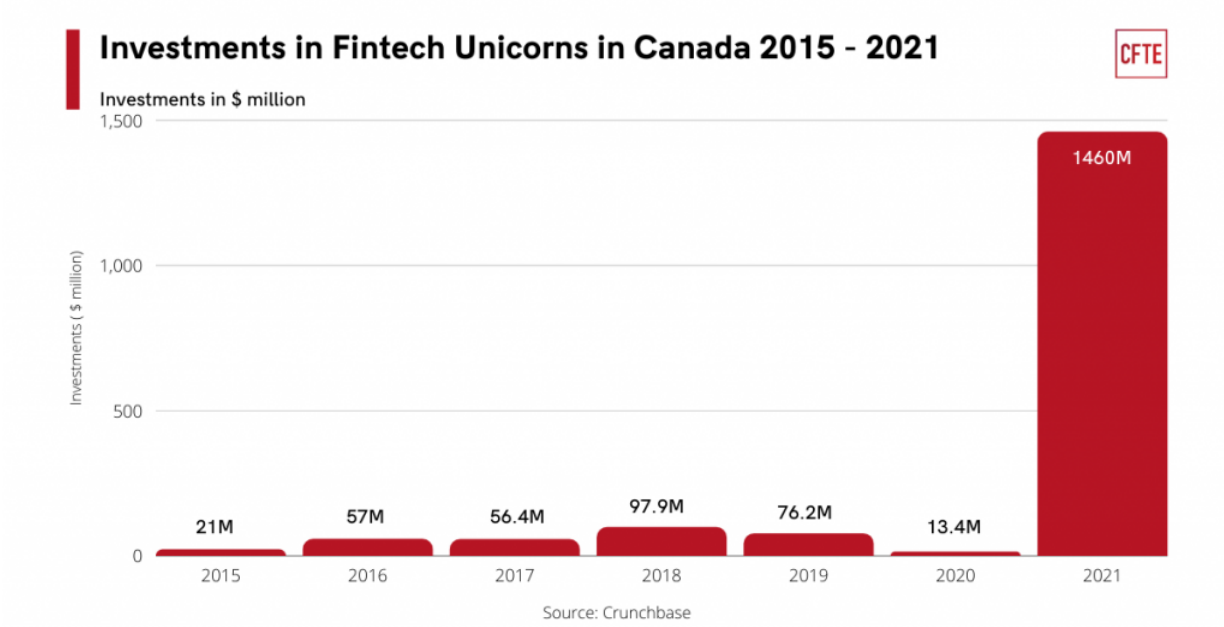
Note: This figure shows the percentage change in net worth by wealth quintile from 2019Q4 to 2020Q4. For each quintile, the total percentage change is broken down by asset/debt category. A positive number for debt refers to a reduction in debt, while a negative value of debt refers to an increase in debt or decrease in wealth.
Source: Statistics Canada.

Figure 21: **Canadian investment in foreign securities**



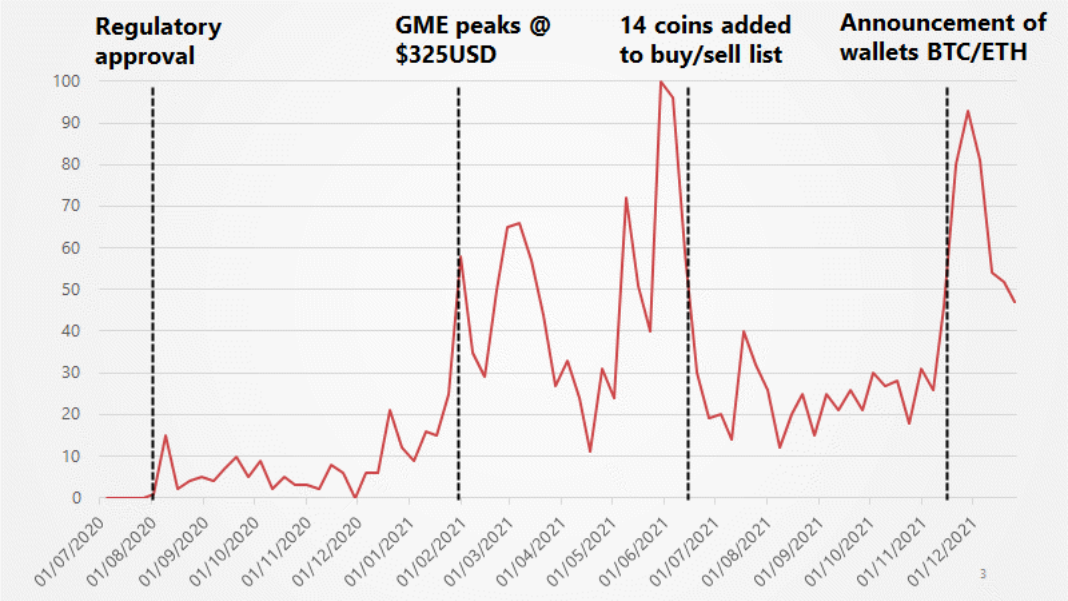
This figure shows the value of investments by Canadians in securities denominated in foreign currenices. For each year the total value is broken down by debt versus equity and investment fund shares.
Source: Statistics Canada.

Figure 22: **Investment in Fintech Unicorns in Canada, 2015-2021**



Note: This figure shows the dollar value of investment in Canadian Fintech Unicorns, defined as late-stage startup companies with a valuation of at least $1 billion.
Source: Centre for Finance, Technology and Entrepreneurship (CFTE).

Figure 23: **Google searches in Canada for 'Wealthsimple Crypto'**



Note: This figure shows the relative search interest for the term "Wealthsimple crypto" in Canada, where 100 represents peak search interest and 0 represents no searches. Source: Google trends search data, Jan. 2020-Dec. 2021.

Tables

Table 1: **Percentage of Canadians aware of Bitcoin, 2016–2021**

	2016	2017	2018	2019	2020	2021
Overall	62	83	89	87	88	89
Male	72	90	93	93	92	91
Female	54	77	85	81	83	87
Age: 18–34	69	87	91	88	86	94
35–54	58	82	88	84	86	86
55 and older	62	82	88	88	91	87
High school or less	55	76	84	82	82	83
College / CEGEP / Trade	59	85	90		90	92
University	78	93	95	92	94	94
Below $30K	49	74	87	77	79	82
$30K–$69K	61	82	88	84	86	90
$70K and above	69	87	91	91	91	90
Employed	64	85	90	88	87	90
Unemployed	74	80	90	75	91	95
Not in labour force	58	81	87	87	90	86
British Columbia	74	93	94	89	91	95
Prairies	66	84	89	88	93	92
Ontario	64	85	92	90	91	91
Quebec	49	75	84	78	75	78
Atlantic	65	80	83	88	88	88
Financial literacy: Low			80	78	76	79
Medium			90	86	88	91
High			94	94	95	96

Note: This table reports the percentage of Canadians who answered "Yes" to "Have you heard of Bitcoin?" The sample sizes are: 1,997 in 2016; 2,623 in 2017; 1,987 in 2018; 1,987 in 2019, 3,893 in 2020, and 1,974 in 2021. Financial literacy scores are calculated based on the responses to the "Big Three" financial literacy questions developed by Lusardi and Mitchell (2014) (see Appendix B for details). 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 2: **Percentage of Canadians who own Bitcoin, 2016–2021**

	2016	2017	2018	2019	2020	2021
Overall	3.2	4.3	5.2	5.1	5.1	13.1
Male	4.4	6.6	6.7	8.1	8.3	19.3
Female	2.2	2.1	3.7	2.2	2.1	7.2
18–34	9.1	11.1	10.5	7.8	11.0	25.6
35–54	1.6	3.2	4.8	6.7	5.6	14.7
55 and older	0.5	0.5	1.7	1.7	0.6	2.8
High school or less	3.8	3.7	2.3	3.3	3.7	11.2
College/CEGEP/Trade	1.5	3.1	5.7	4.3	5.1	10.5
University	4.3	6.7	9.1	8.7	7.4	18.8
Below $30K	3.1	4.3	2.8	3.7	4.3	5.8
$30K–$69K	3.9	5.6	4.8	3.8	4.9	12.4
$70k and above	3.7	4.3	7.0	6.6	5.4	17.2
Employed	3.9	6.1	7.1	6.8	7.4	18.9
Unemployed	7.2	1.9	5.2	0.9	3.8	12.4
Not in labour force	1.5	1.5	1.9	2.3	1.8	3.3
British Columbia	2.8	5.2	6.3	5.3	5.1	19.6
Prairies	2.1	4.1	6.0	3.9	7.6	14.2
Ontario	2.5	3.9	5.2	6.2	5.0	12.3
Quebec	5.5	5.1	4.6	4.4	3.9	11.6
Atlantic	3.2	3.1	2.8	3.8	3.3	6.2
Financial literacy: Low			7.3	7.5	8.4	15.6
Medium			4.7	2.9	5.3	8.8
High			4.1	5.1	5.3	14.7

Note: This table reports the percentage of Canadians who answered "Yes" to "Do you currently have or own Bitcoin?" The sample sizes are: 1,997 in 2016; 2,623 in 2017; 1,987 in 2018; 1,987 in 2019, 3,893 in 2020, and 1,974 in 2021. Financial literacy categories are based on responses to the "Big three" financial literacy questions developed by Lusardi and Mitchell (2014); Bitcoin knowledge categories are based on responses to three questions developed specifically for the BTCOS about the functioning of the Bitcoin system (see Appendix B for details). 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 3: **Marginal Effects of Probability of Bitcoin ownership: 2018-2021**

VARIABLES	2018	2019	2020	2021
Female	-0.033**	-0.046***	-0.090***	-0.074***
	(0.015)	(0.017)	(0.022)	(0.024)
Age: 35-54	-0.050**	0.003	-0.063**	-0.096***
	(0.023)	(0.021)	(0.027)	(0.032)
Age: 55+	-0.076***	-0.037**	-0.101***	-0.201***
	(0.023)	(0.016)	(0.023)	(0.030)
College / CEGEP / Trade	0.039**	0.003	0.034	-0.046
	(0.018)	(0.019)	(0.023)	(0.031)
University	0.045**	0.044**	0.036	-0.002
	(0.018)	(0.022)	(0.023)	(0.035)
Income: $30K-$69K	0.027	-0.015	0.021	0.075**
	(0.021)	(0.025)	(0.023)	(0.029)
Income: $70K+	0.029	-0.011	0.008	0.087***
	(0.019)	(0.027)	(0.022)	(0.030)
Prairies	-0.009	-0.014	0.030	0.002
	(0.025)	(0.030)	(0.032)	(0.040)
Ontario	-0.020	-0.004	0.004	-0.028
	(0.021)	(0.027)	(0.026)	(0.037)
Quebec	-0.011	-0.011	-0.016	0.018
	(0.024)	(0.031)	(0.026)	(0.041)
Atlantic	-0.029	-0.028	-0.008	-0.070*
	(0.027)	(0.032)	(0.031)	(0.041)
Unemployed	0.018	-0.049***	-0.063***	-0.077**
	(0.032)	(0.014)	(0.012)	(0.039)
Not in labour force	-0.019	-0.017	-0.030**	-0.086***
	(0.017)	(0.016)	(0.015)	(0.028)
FL knowledge: Medium	-0.043*	-0.081***	-0.006	-0.078***
	(0.023)	(0.023)	(0.025)	(0.027)
FL knowledge:High	-0.062***	-0.081***	-0.026	-0.046
	(0.023)	(0.023)	(0.023)	(0.032)
BTC knowledge: Medium	0.079***	0.040**		0.024
	(0.017)	(0.016)		(0.025)
BTC knowledge: High	0.188***	0.214***		0.248***
	(0.046)	(0.048)		(0.046)
Observations	1,582	1,590	1,745	1,602

Note: This table reports the marginal effects from a logistic regression where the outcome variable is equal to 1 if a respondent is a Bitcoin owner and 0 otherwise. For the BTCOS samples (years 2018, 2019, and 2021), the working sample is reduced to those who were aware of Bitcoin. For the CAS sample (year 2020), the working sample is reduced to those aware of Bitcoin, as well as the subset of respondents who completed the financial literacy questions at the beginning of the survey. Explanatory variables include all available demographics. The base category is male, aged 18 to 34 years, with a high school education, low income (less than $30,000 per year), from British Columbia, employed, and with low financial literacy and low Bitcoin knowledge. Estimates reflect the likelihood of owning Bitcoin relative to the base category. Significance stars indicate as follows: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 4: **Main reasons for owning Bitcoin, 2016–2021 (%)**

Response options	2016	2017	2018	2019	2021
Buy goods & services / make remittances	45	23	19	15	9
Investment	6	56	40	39	60
Lack of trust / anonymous payments	16	05	19	15	11
Interest in new technologies	33	16	22	31	20

Note: This table reports the percentage of Bitcoin owners in each category according to their primary reason for owning Bitcoin, from 2016 to 2021 (omitting 2020 when the BTCOS was not conducted). Categories are constructed from the full list of response options to Question 3a, see Appendix A. "Lack of trust" includes respondents who said they do not trust banks, the government, or the Canadian dollar. The sample consists of 58 Canadians aged 18 or older who reported owning Bitcoin in 2016, 117 in 2017, 99 in 2018, 89 in 2019, and 226 in 2021. All estimates are calculated using survey weights.

Table 5: **Main reasons for not owning Bitcoin, 2016–2021 (%)**

Response options	2016	2017	2018	2019	2021
Lack of knowledge/understanding/not easy to use	35.2	41.2	38.7	33.6	39.2
Lack of payment function	39.4	30.4	28.2	30.2	23.1
Volatility	3.9	5.7	7.6	7.3	6.7
Concerns or lack of trust	21.2	18.5	22.0	25.2	19.5
I use alternative digital currency	0.3	0.2	0.3	0.5	1.7
A price crash caused my Bitcoin to lose substantial value					0.6
I lost access to my personal cryptocurrency wallet					0.2
I cashed out my Bitcoin for a profit					2.1
Other	0.0	4.1	3.1	3.2	7.0

Note: This table reports the percentages of Canadians who have heard of Bitcoin but do not currently own any, according to their main reason for non-ownership. Non-owners include both those who have never owned Bitcoin and those who owned Bitcoin in the past but no longer do. For 2021, three additional response options were shown only to past Bitcoin owners: 1) "A price crash caused my Bitcoin to lose substantial value", 2) "I lost access to my personal cryptocurrency wallet", and 3) "I cashed out my Bitcoin for a profit". All estimates are calculated using survey weights.

Table 6: **Cash and Bitcoin adoption in Canada**

	Cash on hand		No cash	
	mean	median	percentage	N
Bitcoin Adopters				
2021 BTCOS	578	100	13%	302
2020 CAS November	332	80	13%	181
2019 BTCOS	506	100	8%	139
2018 BTCOS	402	200	7%	144
2017 BTCOS	350	100	3%	154
2017 MOP	320	65	8%	93
Non-Adopters				
2021 BTCOS	171	50	9%	1672
2020 CAS November	205	80	23%	3331
2019 BTCOS	121	45	9%	1848
2018 BTCOS	132	42	8%	1843
2017 BTCOS	92	40	8%	2469
2017 MOP	108	40	9%	3127
2013 MOP	84	40	6%	3663

Note: Bitcoin adopters are both current and past owners (BTCOS) and those who have used digital currency at least once in the past year (MOP). "No cash" is the percentage of respondents not having any cash in their pocket.

Table 7: **Demographic characteristics of recent and long-term Bitcoin owners**

	Between	**groups**	**Within**	**groups**	Pr(Recent=1| X^{own})	
Demographics	Recent	Long-term	Recent	Long-term	Demographics	ME
Overall	0.48	0.52				
Male	0.45	0.55	0.67	0.76	Gender	0.10
Female	0.56	0.44	0.33	0.24		
18-34	0.52	0.48	0.58	0.50	Age	-0.01
35-54	0.39	0.61	0.32	0.45		
55+	0.68	0.32	0.11	0.05		
High School	0.47	0.53	0.35	0.37	High School	
College	0.46	0.54	0.22	0.25	College	-0.02
University	0.51	0.49	0.43	0.37	University	0.13
< 30K	0.61	0.39	0.07	0.04	< 30K	
30K-69K	0.63	0.37	0.37	0.20	30K-69K	0.05
70+	0.40	0.60	0.56	0.76	70+	-0.21
Employed	0.47	0.53	0.85	0.90	Employed	
Unemployed	0.42	0.58	0.02	0.05	Unemployed	-0.22
Not in labour force	0.69	0.31	0.12	0.05	Not in labour force	0.22*
British Columbia	0.45	0.55	0.20	0.22	British Columbia	
Prairies	0.47	0.53	0.19	0.20	Prairies	0.11
Ontario	0.53	0.47	0.39	0.32	Ontario	0.08
Quebec	0.44	0.56	0.19	0.23	Quebec	0.01
Atlantic	0.48	0.52	0.03	0.03	Atlantic	-0.01
FL Low	0.50	0.50	0.38	0.37	FL Low	
FL Medium	0.55	0.45	0.26	0.19	FL Medium	0.08
FL High	0.43	0.57	0.36	0.44	FL High	-0.04
BTC Low	0.54	0.46	0.44	0.35	BTC Low	
BTC Medium	0.46	0.54	0.27	0.29	BTC Medium	-0.09
BTC High	0.43	0.57	0.29	0.35	BTC High	-0.04
N	121	105	121	105		221

Note: The first two columns of this table report the percentages (row margins) of Canadian Bitcoin owners who acquired Bitcoin in 2020 or 2021 (recent owners, Column 1) versus those who acquired Bitcoin prior to 2020 (long-term owners, Column 2). Columns three and four report the percentages (column margins) of recent owners, Column 3, versus long-term owners, Column 4. Column five reports marginal effects estimates from a logistic regression conducted among the sample of Bitcoin owners in 2021, where the outcome variable is equal to 1 if the owner is recent and 0 otherwise.

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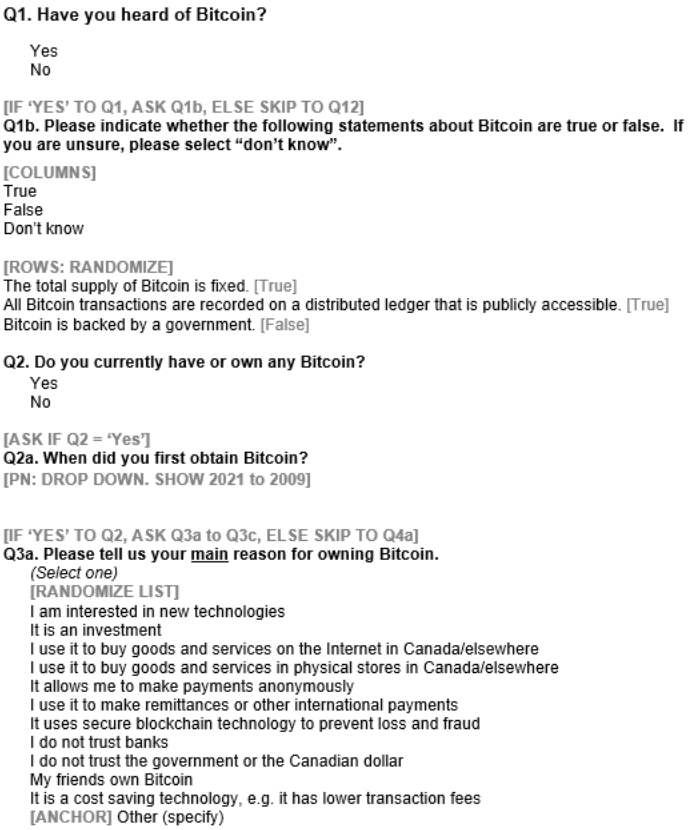
Appendix

A 2021 BTCOS instrument

The 2021 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.

Figure 24: **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 <u>one month</u>, 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 <u>one year</u>, 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 <u>for goods and services</u>?** (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 not 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]

B Bitcoin knowledge and financial literacy questions

In this Appendix, we document how the Bitcoin knowledge and financial literacy categories of "high", "medium", and "low" are constructed. For both topics, a set of three knowledge-testing questions are asked of respondents that contain a single correct answer as well as the option to respond "don't know". The questions for Bitcoin knowledge and financial literacy are shown in Tables 8 and 9, respectively.

Financial literacy questions are taken from the "Big Three" of Lusardi and Mitchell (2014). We compute a financial literacy score as the number of correct answers minus the number of incorrect answers ("don't know" responses do not contribute to the score). Financial literacy is then classified as *high* (score= 3), *medium* (score= $1, 2$), or *low* (score<= 0). Bitcoin knowledge categories are constructed in a similar way.

Response distributions for each financial literacy question from the 2018, 2019, and 2021 BTCOS, as well as the 2020 CAS, are shown in Table 10 (raw unweighted counts) and Table 11 (weighted percentages).

Table 8: **Bitcoin knowledge statements**

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 publically accessible.	**True**
	False
	Don't know

Note: This table shows the three statements used to test Bitcoin knowledge in the 2017-2021 BTCOS. 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 9: **Financial literacy questions**

Question	**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 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
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 2018-2021 BTCOS. Questions are taken from the "Big Three" of Lusardi and Mitchell (2014). Correct answers are in bold.

Table 10: **Number of correct, incorrect and 'don't know' responses to financial literacy questions**

	2018 BTCOS			2019 BTCOS		
	Owners	Non-owners	Overall	Owners	Non-owners	Overall
Question 1						
Correct	70	1,473	1,543	64	1,453	1,517
Incorrect	23	230	253	17	234	251
Don't know	6	185	191	8	211	219
Question 2						
Correct	52	1,211	1,263	44	1,186	1,230
Incorrect	39	410	449	33	372	405
Don't know	8	267	275	12	340	352
Question 3						
Correct	51	1,115	1,166	52	1,054	1,106
Incorrect	23	114	137	13	116	129
Don't know	25	659	684	24	728	752
	2020 CAS			**2021 BTCOS**		
	Owners	Non-owners	Overall	Owners	Non-owners	Overall
Question 1						
Correct	83	1,672	1,755	180	1,335	1,515
Incorrect	14	107	121	36	200	236
Don't know	1	69	70	10	213	223
Question 2						
Correct	57	1,286	1,343	146	1,094	1,240
Incorrect	37	415	452	66	351	417
Don't know	4	147	151	14	303	317
Question 3						
Correct	58	1,259	1,317	135	965	1,100
Incorrect	29	143	172	49	150	199
Don't know	11	446	457	42	633	675

Note: This table reports the number of respondents (unweighted) who answered each financial literacy question correctly and incorrectly, as well as the number who answered "don't know", broken down by Bitcoin ownership. Bitcoin owners are those who answered "Yes" to "Do you currently have or own Bitcoin?" while non-owners are those who answered "No". BTCOS refers to the Bitcoin Omnibus Survey, while CAS refers to the Cash Alternative Survey. The sample sizes are 1,987 in 2018, 1,987 in 2019, 1,946 in 2020, and 1,974 in 2021.

Table 11: **Shares of correct, incorrect and 'don't know' responses to financial literacy questions**

	2018 BTCOS			2019 BTCOS		
	Owners	Non-owners	Overall	Owners	Non-owners	Overall
Question 1						
Correct	69.0	77.2	76.8	71.0	74.4	74.2
Incorrect	27.2	12.7	13.4	19.9	13.2	13.6
Don't know	3.8	10.1	9.8	9.2	12.4	12.2
Question 2						
Correct	56.5	60.4	60.2	45.5	57.3	56.7
Incorrect	36.6	23.8	24.5	41.5	22.8	23.8
Don't know	6.8	15.8	15.3	13.1	19.8	19.5
Question 3						
Correct	51.0	55.8	55.5	55.4	53.3	53.4
Incorrect	22.7	6.1	7.0	21.6	6.8	7.5
Don't know	26.3	38.1	37.5	23.0	39.9	39.0
	2020 CAS			**2021 BTCOS**		
	Owners	Non-owners	Overall	Owners	Non-owners	Overall
Question 1						
Correct	83.6	88.8	88.5	77.2	74.5	74.8
Incorrect	16.1	7.8	8.3	18.7	11.5	12.5
Don't know	0.3	3.4	3.3	4.2	14.0	12.7
Question 2						
Correct	62.7	65.5	65.3	57.1	57.3	57.2
Incorrect	35.5	26.6	27.2	36.1	23.2	24.9
Don't know	1.8	7.8	7.5	6.7	19.6	17.9
Question 3						
Correct	58.3	67.3	66.7	55.5	51.6	52.1
Incorrect	27.3	8.5	9.6	23.9	9.9	11.7
Don't know	14.5	24.3	23.7	20.6	38.5	36.2

Note: This table reports the share of respondents (weighted) who answered each financial literacy question correctly and incorrectly, as well as the number who answered "don't know", broken down by Bitcoin ownership. Bitcoin owners are those who answered "Yes" to "Do you currently have or own Bitcoin?" while non-owners are those who answered "No". BTCOS refers to the Bitcoin Omnibus Survey, while CAS refers to the Cash Alternative Survey. The sample size is 1,987 in 2018, 1,987 in 2019, 1,946 in 2020, and 1,974 in 2021.

C Sample composition and data quality considerations

The 2021 BTCOS recruited participants from three sources. The first is an opt-in panel maintained by our survey partner Ipsos (iSay). iSay participants voluntarily choose to join the panel and are invited to complete various surveys in exchange for rewards. Ipsos conducts quality assessments along numerous dimensions to ensure that panelists are participating in good faith and remain active in the panel, and the panel is built to produce representative samples based on individual requirements.

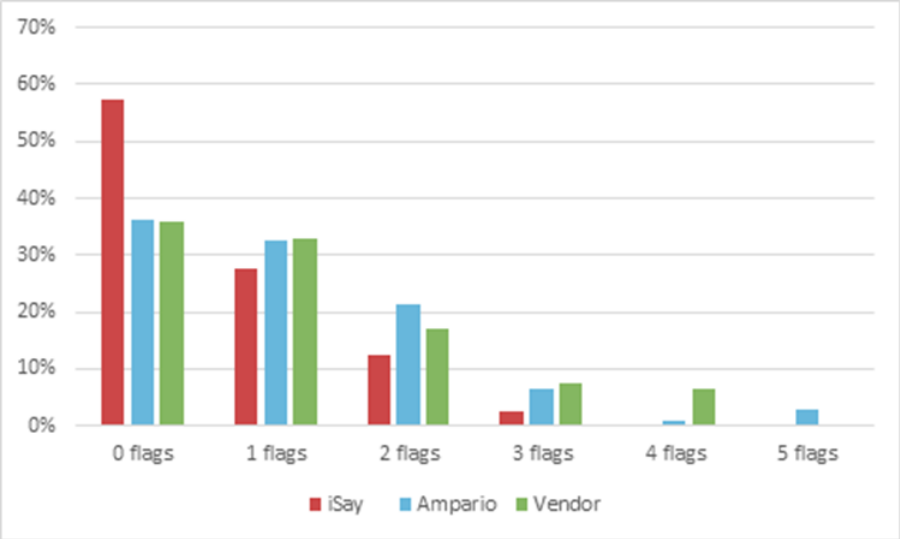
The second source (Ampario) uses internet recruitment through advertisements on websites or social media. In this case, participants can complete an individual survey but do not have to join a panel. The goal of internet recruitment is to capture segments of the population that may be hard-to-reach or have low response rates in opt-in panels, such as young men. This is especially important for studies of cryptocurrencies because young men are the most frequent owners of Bitcoin and other cryptocurrencies. The third source of recruitment is from third-party vendor panels. Vetted vendors partner with Ipsos to provide tailored samples based on pre-specified inclusion criteria, with the purpose once again of getting information from hard-to-reach populations.

To check the quality of the overall 2021 BTCOS data and to get a sample that provides the most accurate required information, a data quality analysis is performed, and weights are calculated in order for the sample to match seven important demographic characteristics from the 2016 Canadian Census.

First, the data cleaning is based on flagging the answers of respondents that are potentially low quality. The flagging rules are related to the time of survey completion, pricing behaviour, amount of cash holdings, amount of Bitcoin holdings, Bitcoin knowledge, and life expectancy (c.f. the quality indicators used in Wenz et al. (2021)). Specifically, flags are assigned in the following cases: a duration of fewer than 200 seconds for completing a survey questionnaire designed for Bitcoin owners; acknowledging ownership of "Diem" (formerly Libra), which is non-existent; answering "Don't know" to all Bitcoin knowledge and financial literacy questions; dubious beliefs about life expectancy (e.g., a respondent who expected to live less than 25 years when their age was above 25 years old, or a respondent who expected to live longer than 110 years); odd or extreme values for cash holdings (greater than C$8,000); using Bitcoin once per week for both purchases and transfers; odd answers about Bitcoin price expectations once the participants were informed about the current price; and, answers that point to expected future Bitcoin adoption rates that are notably higher than expected future survival rates. The analysis of the flagging rules across the three sample sources is presented by plotting the frequency of total flags by sample source, see Figure 25.

The results emphasize that iSay, as expected, is the sample source with the highest proportion of valid information, while respondents from Ampario and the vendor panels are

Figure 25: **Percentage of Bitcoin owners flagged, by sample source and number of flags**



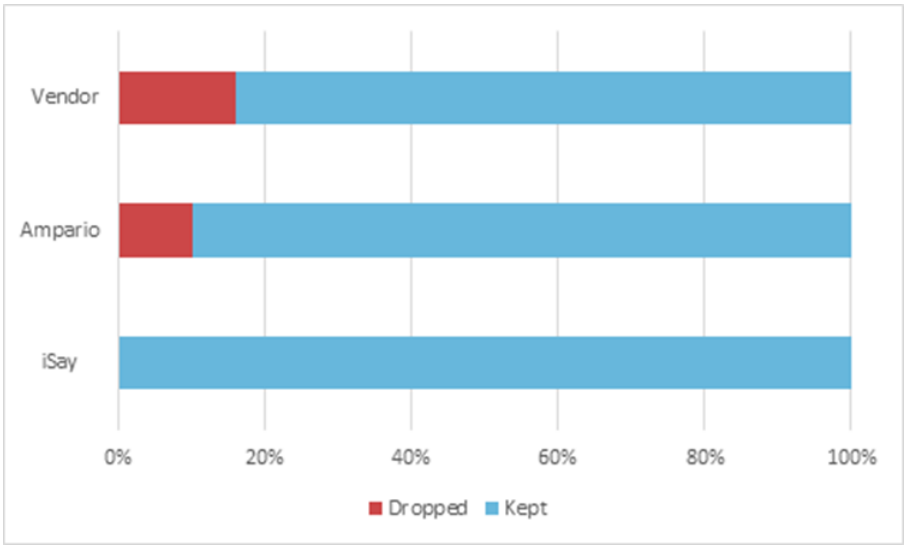
Note: Total number of Bitcoin owners in the sample is 254, from which 28 were dropped based on flagging rules and manual checks. The highest number of flags a respondent that owns Bitcoin received is 5 out of 9 flagging rules.

more likely to provide answers that can be flagged. After ranking the individual observations based on the number of flags (ordering from the highest number of flags received to the lowest number), answers were re-inspected to decide whether they qualify as low quality. Once a decision was made that an observation is low quality, we dropped it. The proportion of dropped observations from each sample source is provided in Figure 26.

All the dropped observations were from Ampario and vendor panels, with the highest proportion of dropped observations (16%) from the vendor panel, followed by Ampario, from which 10% of the observations were dropped.

Once the final working sample is obtained, a weighting procedure at the observation level is conducted. The weighting procedure for the 2021 BTCOS follows the methodology used in the 2018 BTCOS (Henry et al. (2020)) and 2019 BTCOS (Balutel et al. (2022a)). In particular, we use a raking procedure, outlined in Deville et al. (1993), to adjust the final sample for differences between the sample demographic composition of age, gender, region, education, marital status, and household income with the equivalent statistical measures from the Canadian population reported in the 2016 Canadian Census. The obtained weights are then used to generate all the results of the paper presented in both the Tables and the Figures.

Figure 26: **Percentage of Bitcoin owners kept and dropped, by sample source**



Note: Total number of Bitcoin owners in the sample is 254, from which 28 were dropped based on flagging rules and manual checks. 16% of dropped observations are from vendor panels, 10% from Ampario, and no dropped observations from iSay.