

## Who reports cryptocurrency to the IRS?

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**Abstract:** Cryptocurrency has been the subject of heightened regulatory and investor attention in recent years, and regulators and policymakers across the globe are deliberating on how to account for, regulate, tax, and oversee digital assets and cryptocurrency marketplaces. Yet researchers have a limited understanding of key attributes of those who deal in crypto assets, such as whether their financial sophistication differs from that of other investors. Using U.S. administrative data, we provide evidence on (i) the attributes of taxpayers reporting cryptocurrency sales to the IRS, (ii) how these attributes are evolving, and (iii) how investors treat cryptocurrency versus other financial assets in certain settings. The results suggest that average reporting cryptocurrency sellers exhibit demographic attributes generally associated with less financial sophistication and are more likely to trade in meme stocks. Overall, we provide timely evidence that can inform cryptocurrency policy deliberations by highlighting the characteristics of taxpayers who appear to report cryptocurrency sales.

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## 1. Introduction

We use U.S. administrative data to study the selling behavior of cryptocurrency investors whose sales are reported to the Internal Revenue Service (IRS). U.S. presidents from both major parties have focused on cryptocurrency. On March 9, 2022, with cryptocurrency market caps exceeding \$3 trillion, President Joe Biden issued a pivotal executive order “outlining the first ever, whole-of-government approach to addressing the risks and harnessing the potential benefits of digital assets and their underlying technology” (White House 2022).<sup>1</sup> Meanwhile, President Donald Trump has indicated support for a strategic bitcoin reserve and may propose eliminating taxes on gains from certain cryptocurrencies (Serino 2024; Valdez 2024). Despite the heightened regulatory emphasis on cryptocurrencies, considerable uncertainty remains regarding how to account for, tax, regulate, and oversee cryptocurrencies and their marketplaces.<sup>2</sup> Important policy-relevant questions abound, including whether a cryptocurrency is a security that should be regulated or simply a product that introduces a buyer-beware situation, with no need for regulatory oversight. Moreover, researchers have limited population-level evidence about the identities and behavior of cryptocurrency traders, inhibiting assessments of potential means of cryptocurrency regulation, which is often predicated on who is involved in the regulated activity.

We contribute to this discussion by using administrative IRS data to pursue two related research objectives. First, we examine preliminary evidence on who reports cryptocurrency to the

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<sup>1</sup> This sweeping order directs or encourages digital-assets-related efforts from major U.S. agencies and regulators, including the Federal Reserve, the Treasury, the Financial Stability Oversight Council, and the Commerce Department.

<sup>2</sup> For example, the IRS issued Notice 2014-21 in 2014 detailing how cryptocurrency would be taxed as property. The U.S. Treasury’s Financial Crimes Enforcement Network (FinCEN) issued guidance treating cryptocurrencies as currency. Other market participants, such as the FASB, also have shown interest in updating rules for cryptocurrencies (Maurer 2022). The SEC has pursued regulatory action that presumes cryptocurrencies are securities. The picture for cryptocurrency regulation is even less clear internationally, with some countries, like China, Egypt, banning cryptocurrencies (Quiroz-Gutierrez 2022), while others have become cryptocurrency havens. Portugal, for instance, ruled in 2018 that cryptocurrency traders are exempt from the country’s 28% income tax (Hall 2022).

IRS by benchmarking our estimates of the incidence of reported cryptocurrency sales against public reports—from government, organizational, and academic sources—of cryptocurrency ownership or activity and provide descriptive evidence about reporting cryptocurrency sellers. Second, we study whether the level of financial sophistication differs between reporting cryptocurrency investors and other (equity) investors.

Our approach allows us to provide context for how the frequency of historical cryptocurrency tax reporting relates to the overall use of cryptocurrency in the United States and to provide insights on the over 17 million U.S. taxpayers reporting (or for whom third parties report) cryptocurrency to the IRS. The unique administrative IRS data we use also enlarge the understanding of who reports sales of cryptocurrency by expanding (i) the number of individuals, (ii) the length of the time-series, and (iii) (arguably) the nature and scope of credible demographic data we can examine relative to other analyses of cryptocurrency users. That said, the data also have limitations. For example, we cannot observe cryptocurrency ownership or sales *not* reported to the IRS. While this feature of our data limits the conclusions we can draw about U.S. taxpayers' use of cryptocurrency broadly, it offers insights regarding the potential magnitude of the gap between cryptocurrency ownership versus sales reported in tax filings.

Our first objective is to benchmark the incidence of reported cryptocurrency sales against public reports and provide descriptive evidence of reporting cryptocurrency sellers. Our sample period extends from 2013–2021, covering much of the time cryptocurrencies have existed, and uses anonymized proprietary IRS data on reported sales of key cryptocurrency assets (i.e., Bitcoin and Ethereum). We treat taxpayers who are direct sellers subject to third-party reporting and reporting direct sellers not subject to third-party reporting as reporting cryptocurrency sellers. External surveys, public company reporting, and academic work suggest that between 12 percent

and 21 percent of U.S. adults had owned cryptocurrency at some point through 2021.<sup>3</sup> In contrast, our estimates from IRS data suggest that 6.5 percent (17.4 million individuals) report cryptocurrency sales. Amid the explosive growth in cryptocurrency values, this comparison highlights an important gap between the number of U.S. taxpayers who claim to own cryptocurrency (and whose sales could be subject to tax reporting) and estimates of the number who have reported cryptocurrency sales. Using the adoption of a virtual currency question on tax returns in 2019, we find that reporting of cryptocurrency sales increased for taxpayers who (i) were not subject to third-party reporting and (ii) did not have a paid preparer. This pattern suggests that, absent the IRS check-box rule, some self-preparing cryptocurrency sellers may not have been aware of tax reporting requirements regarding realized cryptocurrency gains.<sup>4</sup>

Our second objective is to understand whether the level of financial sophistication differs between reporting cryptocurrency investors and other (equity) investors. We examine a broad set of demographic characteristics to understand the population of reporting cryptocurrency sellers and how it has evolved relative to equity investors. We find that, on average, reporting cryptocurrency investors report lower income, are younger, are more likely to be students, and are less likely to itemize tax deductions than reporting equity-only securities sellers. This pattern of attributes suggests that they are less financially sophisticated than equity sellers.<sup>5</sup> To explore this possibility, we exploit three unique settings to assess whether cryptocurrency investors' tax

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<sup>3</sup> We use the 2020 Census as a population benchmark to translate academic and survey percentage ownership results into the number of U.S. adults reporting cryptocurrency ownership.

<sup>4</sup> Alternatively, it could mean they are, on average, less tax compliant and perceive a difference in the probability of detection under the virtual currency check-box regime. Differences between cryptocurrency ownership and reporting to the IRS could reflect (i) the tax system's use of realization events (e.g., Lei et al. 2020), rather than ownership (i.e., one can own cryptocurrency and not need to report anything until engaging in a taxable transaction, such as a sale), (ii) potential underreporting to the IRS, or (iii) our failure to capture cryptocurrency reporting in the IRS data.

<sup>5</sup> Our assumptions about financial sophistication align with the SEC's accredited investor rules, which seemingly link higher income (or wealth) with higher sophistication (or at least fewer investment restrictions) (SEC 2025).

reporting and trading behavior is consistent with financial sophistication (or lack thereof) and whether investors appear to treat (report) cryptocurrency differently than other financial assets.

First, we examine how two key attributes of cryptocurrency and stocks, returns and volatility, relate to IRS reported volume of those investments to examine investor trading behavior. Here the evidence is consistent with investors treating cryptocurrency more like meme stocks than other traditional assets.<sup>6</sup> We find taxpayers report fewer trades when returns are more positive and find some evidence they report more trades when volatility is higher. Second, we explore whether cryptocurrency investors are tax savvy. To do so, we use a bunching methodology around the 52-week holding period for long-term capital gains. Both reporting equity sellers and reporting cryptocurrency sellers appear to strategically time sales of traditional equities.<sup>7</sup> However, for their cryptocurrency sales, reporting cryptocurrency sellers appear to respond less to tax holding period incentives. Finally, we examine whether cryptocurrency investors tend to report more meme stock sales, another asset class associated with unsophisticated investors, and find that they trade meme stocks at higher rates than do other investors. This pattern aligns with evidence that cryptocurrency exhibits similar trading patterns to meme stocks (Costola et al. 2021).

Overall, the evidence across various settings combines to paint a consistent picture that, in many cases, reporting cryptocurrency sellers trade and report in ways generally associated with less-sophisticated investors—their demographic characteristics, from age to income, suggest less

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<sup>6</sup> In early 2021, several stocks now known as “meme stocks” saw large increases in price and volatility due to a spike in attention from retail investors. This attention primarily stemmed from the Reddit subreddit Wallstreetbets, an online community of retail investors who discuss stocks and stock trading (Telesca, Kjellman Schmidt, 2021; Chacon, Morillon, and Wang 2022). Gamestop Corp., the primary meme stock, saw an increase in share price from under \$20 to over \$300 in a short time. The online trading platform Robinhood announced trading restrictions on 50 stocks that experienced heightened volatility in January 2021 (Robinhood 2021; Telesca, Kjellman Schmidt, 2021; Hu, Jones, Zhang, and Zhang 2023).

<sup>7</sup> We refer to traditional stocks or equities as those securities that have valid CUSIPs reported on form 1099-B.

sophistication and their meme-stock trading further suggests that they are less sophisticated than reporting equity investors.

This study contributes to the literature in two ways. First, we extend the growing cryptocurrency literature in accounting (Amiram, Jørgensen, and Rabetti 2022; Cong, Landsman, Maydew, and Rabetti 2023; Merkley, Pacelli, Piorkowski, and Williams 2024) by providing unique, broad-sample evidence about who sells cryptocurrency, how their attributes are evolving, and how reported cryptocurrency trading relates to holding period tax incentives and other reported trading behavior (i.e., meme stocks). Our evidence also contributes to a growing literature regarding how cryptocurrencies as an asset class fit into the financial system by highlighting the characteristics of their investors over time (Bourveau, De George, Ellahie and Macciocchi 2021; Gan et al. 2021; Arnosti and Weinberg 2022; Malik et al. 2022; Cheng et al. 2019; Makarov and Schoar 2020).

Our paper also provides insights that can inform current policy deliberations, regulatory efforts, and tax administration.<sup>8</sup> Our evidence suggests that reporting cryptocurrency sellers appear to be less sophisticated than reporting equity investors, which could inform regulators as they consider new cryptocurrency rules. Our estimates of cryptocurrency reporting will also be of interest to policymakers as they consider potential changes to cryptocurrency taxation (Valdez 2024). Our initial evidence on how the virtual currency checkbox, a “smart return” design feature (Bankman, Nass, and Slemrod 2015), may improve tax reporting should be of interest to regulators given tax authority resource constraints (e.g., Nessa, Schwab, Stomberg, and Towery 2020). At the same time, we document that many taxpayers report cryptocurrency but fail to check the box,

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<sup>8</sup> Apart from President Biden’s executive order issued on March 9, 2022, the U.S. Federal Reserve released a report on a central bank digital currency in January 2022 and asked for comments from stakeholders on the proposal (Federal Reserve 2022a), the SEC has filed several lawsuits against cryptocurrency platforms such as Ripple and Blockfi (SEC 2020, SEC 2022), and the U.S. Treasury is planning to issue new preliminary guidance (Versprille 2022).

highlighting the continued need for taxpayer education in new tax areas. Despite an increase in attention to cryptocurrency by the IRS, our analysis of public reporting of cryptocurrency ownership compared to IRS reporting of cryptocurrency reinforces the continued need for education and enforcement for cryptocurrency-related tax issues (TIGTA 2024). Our results present initial evidence that taxpayers may treat cryptocurrency differently than other financial assets. As taxpayer behavior is a key focus in understanding compliance, this change in behavior may affect how the IRS and U.S. Treasury Department assess the impact of future cryptocurrency tax laws. Finally, our evidence on third-party reporting and cryptocurrency tax compliance could be of interest to the IRS as it considers regulations for third-party broker digital-asset reporting, pursuant to the Infrastructure Investment and Jobs Act (Cadwalader, Wickersham & Taft LLP 2023).

While the data we use allow us to provide important new insights, the scope of our conclusions is limited. For example, U.S. administrative data only allow us to observe cryptocurrency and equity sales *reported* to the IRS, either on individual tax returns or by third parties (e.g., broker-dealers). If taxpayers neglect to report or intentionally conceal their trades or we fail to detect reporting in our analyses, our tests will not capture the full scope of cryptocurrency trades. Further, our sample is not a random selection of the population of U.S. taxpayers who trade in cryptocurrency; rather, it reflects those who report their sales. Although our combined evidence suggests reporting cryptocurrency sellers trade and report in ways generally associated with less-sophisticated investors, this pattern could reflect (i) cryptocurrency activity or reporting being more pronounced among less-sophisticated investors, (ii) more sophisticated investors exhibiting a stronger tendency to hold rather than sell cryptocurrency (i.e., not needing to report sales), (iii) savvy investors finding ways to conceal their cryptocurrency profits (e.g., De Simone et al. 2024;

Li et al. 2024), or (iv) a combination of these possibilities. Future work could further expand the understanding of how tax and other incentives shape tax and equity reporting in the cryptocurrency setting.

## **2. Background**

Bitcoin, the first cryptocurrency, is a decentralized, public, pseudo-anonymous payment network (Nakamoto 2008). Its backbone is the blockchain, which serves as a public accounting ledger, maintaining the entire transaction history of Bitcoin. The literature has examined cryptocurrency users using blockchain analysis, surveys, and archival data.

Several papers use heuristics and machine learning to group individual wallet addresses together to identify “users” (Athey et al. 2016; Ron and Shamir 2013; Meiklejohn et al. 2013; Makarov and Schoar 2021). These analyses capture all transactions that occur on the blockchain but are limited to single cryptocurrencies, such as Bitcoin, and they omit users who buy or sell on certain exchanges and users who may gain exposure to Bitcoin indirectly through related investments. Blockchain-based analyses inhibit distinguishing between business users and individuals, determining the geographic location of users, and identifying individual user characteristics, such as income, gender, or marital status. These limitations have led to dramatically different estimates of the number of unique Bitcoin users (Athey et al. 2016; Amiram, Jørgensen, and Rabetti 2022; Makarov and Shoar 2021).

Surveys have highlighted the growth in cryptocurrency ownership over time. Recent surveys estimate between 12 percent and 21 percent of U.S. adults own or have owned cryptocurrency, up from between 1 percent and 8 percent in earlier surveys (Federal Reserve 2022b; Pew Research 2019; Yougov 2022; Benneton and Campiani 2020). But the surveys have limitations. For example, the Federal Reserve survey notes: “Because the survey is conducted

online, the sample population may be more technologically connected than the overall population, which could increase the share of adults reporting use of emerging technologies such as cryptocurrencies.” We compare recent survey evidence to our sample in section 4.2.

Closest to our study are three papers that examine cryptocurrency users using archival data. Two of those—the work of Hackethal, Hanspal, Lammer, and Rink (2021) and Hasso, Pelster, and Breitmayer (2019)—use German and U.K. financial data respectively to examine cryptocurrency investors. Both samples end in 2017, the point where we find a significant shift in the composition of cryptocurrency traders. Both papers examine detailed trading behavior, such as leverage and use of options or derivatives. However, both can only observe financial instruments related to cryptocurrency on a single platform rather than the direct ownership of cryptocurrency across all holdings. A contemporaneous working paper, by Aiello et al. (2023), uses credit card and bank data to examine the effects of cryptocurrency on household wealth by identifying deposits and withdrawals from centralized cryptocurrency exchanges. The paper finds that households use wealth generated by cryptocurrency to increase consumption.

Our paper complements prior research by both expanding the sample window, increasing the number of individuals, and examining assets sold across all of an individual’s reported taxable asset sales that we identify. Our data allow us (i) to compare reporting cryptocurrency sellers to the reporting non-investing public and (ii) to examine the characteristics of different types of reporting cryptocurrency sellers. Finally, we provide U.S. evidence, whereas Hackethal et al. (2021) and Hasso et al. (2019) use European samples.<sup>9</sup> With U.S.-based customers of

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<sup>9</sup> The United States has had a different approach to cryptocurrency regulation than European countries. Europe has been seen as friendlier to cryptocurrency. Brian Armstrong, CEO of the cryptocurrency exchange Coinbase, has criticized the United States as “anti-crypto” (Moen 2023). Former SEC Chair Gary Gensler was aggressive in attempting to regulate the cryptocurrency industry, going as far to say, “We don’t need more digital currency” (Baydakova 2023).

cryptocurrency exchanges generally subject to stronger verification requirements and more regulation, it is unclear whether investors would behave similarly in the United States and Europe (Toppa 2023). A U.S.-based sample is also key to understanding the tax reporting behavior we document. Although we acknowledge that IRS data have limitations (discussed in Section 3), including an inability to examine trading details (e.g., intraday trades, securities held but not sold) and dependence on taxpayers reporting their trading to tax authorities, we offer complementary evidence that expands the understanding of reporting cryptocurrency sellers.

### **3. Research sample and data**

#### *3.1 Sample construction*

To examine the characteristics of those who sell cryptocurrencies, we access confidential taxpayer information from the IRS for tax returns filed between 2013 and 2021.<sup>10</sup> Using three methods, we identify over 17.4 million individuals who report some form of exposure to cryptocurrency, but we focus primarily on 7.6 million taxpayers who report sales of cryptocurrency directly.<sup>11</sup> We compare them to our total sample of over 221 million U.S. taxpayers.

While our large sample allows us to examine much of the U.S. population, it has limitations. In particular, the U.S. tax system relies upon the realization principle, which means we only observe users when they sell cryptocurrencies and report those transactions.<sup>12</sup> This problem prevails in much of the accounting literature, in which evidence of behavior is only observed contingent on its reporting or detection (Cecchini et al. 2010; Hopkins et al. 2015). Although we cannot observe nonsellers and nonreporting sellers, we use several identification

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<sup>10</sup> We do not attempt to identify cryptocurrency held by businesses (Forms 1120, 1120S, 1065) or trusts (Form 1041). To the extent that cryptocurrency transactions from flow-through entities affect individual tax returns, we will not identify those transactions.

<sup>11</sup> When using the term “taxpayer,” we refer to the tax return filing. Married filing joint returns would be a single taxpayer but would be considered two individuals.

<sup>12</sup> Realization includes trading one coin for another (rather than for cash). For example, if a taxpayer were to trade Dogecoin for Bitcoin, that crypto to crypto exchange would be a taxable event that we could identify, if reported.

methods to examine differences in cryptocurrency users, including using the virtual currency checkbox added to tax forms in 2019 and examining cryptocurrency users based on whether they hold cryptocurrency directly or indirectly. In addition, the law does not require very low-income taxpayers to file tax returns. To the extent that underreporting and nonfiling vary with the investor characteristics we study, our estimates may not reflect the true population of cryptocurrency users.

We begin by identifying taxpayers who hold cryptocurrency directly, meaning they have a direct ownership interest in the asset. In the case of cryptocurrency, this may mean holding Bitcoin or another cryptocurrency in a crypto wallet, where it is controlled solely by the user, but it may also include holding cryptocurrency through an exchange (e.g., Coinbase). We identify direct cryptocurrency sales data from two sources, IRS Form 8949 reported by the taxpayer, and Form 1099-B reported to the IRS by a third party. We use a textual search to identify transactions that are likely to be cryptocurrency.<sup>13</sup> We focus on two types of cryptocurrencies, Bitcoin and Ethereum, which are, by far, the two most valuable, widely held, and well-known cryptocurrencies during our sample period (State of Crypto Literacy Report 2021; Ballard 2018).<sup>14</sup> Our textual analysis consists of two steps. First, we search descriptions reported on Forms 8949 and 1099-B for a dictionary of cryptocurrency-related words. Then we refine the results by searching for a second set of exclusion words. We detail our methodology and its limitations in Online Appendix A. We define *Reporting Crypto Seller* as equal to 1 if a taxpayer is identified as having at least one direct cryptocurrency transaction on either Form 8949 or 1099-B in a given year and 0 otherwise.

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<sup>13</sup> Although we use IRS data in our analyses, we designed and implemented the process we use to identify cryptocurrency sales and the IRS does not necessarily use the same method to identify cryptocurrency transactions.

<sup>14</sup> The term “Ethereum” can refer to both the cryptocurrency “Ether” and the blockchain platform on which Ether runs. Consistent with the literature, we use “Ethereum” to refer to the cryptocurrency (Marakov and Shoar 2020; Griffin and Shams 2020) rather than the blockchain network.

We also use two supplemental methods to identify cryptocurrency investors. First, we identify regulated securities that may proxy for holding virtual assets directly. *Indirect Crypto* is coded as 1 for any taxpayer who receives a 1099-B from an identified cryptocurrency-related investment trust, fund, or product that is publicly traded and invests only or primarily in cryptocurrency in a given year and 0 otherwise.<sup>15</sup> Finally, as a third way to identify cryptocurrency investors, we use the Virtual Currency Checkbox. In 2019, the IRS introduced a question asking taxpayers to check a box if they had engaged in certain cryptocurrency transactions throughout the year. The checkbox provides a simple alternate method to identify individuals reporting cryptocurrency activity, even if we cannot identify the transactions on the tax return. We code *Virtual Checkbox* as 1 for taxpayers who check “yes” to the virtual currency question on their tax return and 0 otherwise.

We merge our sample of cryptocurrency taxpayers with other IRS tax forms, primarily Form 1040 and its related schedules, to construct our other variables. We supplement the Form 1040 data with information from third-party reported forms, such as 1098-Mort for mortgage interest and 1098-T to identify students. We explain how each variable is constructed in Appendix A. We obtain information on birth year and gender from the Social Security Administration through the IRS. Our sample consists of over 1.3 billion taxpayer-year records. In total, our sample consists of 221 million unique taxpayers over the sample period, including over 7.6 million unique taxpayers who we identify as reporting direct cryptocurrency ownership.<sup>16</sup>

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<sup>15</sup> See Appendix B for the list of securities we use to determine indirect cryptocurrency ownership.

<sup>16</sup> In developing our sample and variables, although taxpayers file a single return, the data from that return are stored across multiple databases that we merge to create our panel of taxpayers. To retain the most taxpayers possible, we keep all returns with a valid taxpayer identification number. If a taxpayer files two returns, we keep the most recently filed return. Although we include taxpayers who paper file their returns, paper filers may have a different reporting environment or characteristics than electronic filers. Specifically, we are unable to textually search Form 8949 for paper filers, and so identification of cryptocurrency is achieved solely through third-party reporting. Due to this difference, we examine paper filers in Online Appendix B.

### 3.2 Descriptive statistics

We report general descriptive statistics for our sample in Table 1 Panel A and separate our sample into three distinct groups: *Reporting Non-Investor* (taxpayers with no *Capital Gain*, no *Dividends*, and no cryptocurrency), *Reporting Non-Crypto Investor* (taxpayers with either *Capital Gain* or *Dividends* not equal to zero but *Reporting Crypto Investor* equal to zero), and *Reporting Crypto Investor* (taxpayers who meet at least one criterion for cryptocurrency reporting, as noted in Section 3.1). We find that *Reporting Crypto Investors* are younger, less likely use a *Paid Preparer*, and are more likely to be a *Student*. We generally find that their average *Taxable Income* is lower than that of *Reporting Non-Crypto Investors* but higher than that of *Reporting Non-Investors*. *Reporting Crypto Investors* report less investment income (e.g., *Dividends*, *Interest*, and *Capital Gain*) than *Reporting Non-Crypto Investors*. We also find that *Reporting Crypto Investors* are more likely to claim the earned income credit (*EIC*) than *Reporting Non-Crypto Investors* but less likely to do so than *Reporting Non-Investors*.<sup>17</sup>

In Table 1 Panel B, we partition *Reporting Crypto Investors* into three distinct groups. *Reporting Crypto Sellers* hold cryptocurrency directly and report sales on Form 8949 or have transactions reported to them on Form 1099-B. *Reporting Indirect Crypto* are taxpayers who have exposure to cryptocurrency through regulated investment funds and trusts but are not *Reporting Crypto Sellers*. *Reporting Virtual Checkbox* are taxpayers who check yes to the virtual currency question on Form 1040 but for whom we do not identify any specific transactions. We find that *Reporting Crypto Sellers* and *Reporting Virtual Checkbox* taxpayers generally have less income

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<sup>17</sup> In Online Appendix C, we examine how the racial makeup of *Reporting Crypto Sellers* has evolved.

and are younger than *Reporting Indirect Crypto* taxpayers. Older more wealthy taxpayers may prefer to invest in regulated financial assets over holding cryptocurrency directly.<sup>18</sup>

In Figure 1 Panel A, we graph the number of tax returns filed that indicate some cryptocurrency exposure over time. The number of *Reporting Crypto Sellers* has increased dramatically over time. By the end of our sample in 2021, we observe over 6.5 million tax returns that report cryptocurrency sales. This growth results in over 70% of our taxpayer-year observations concentrated in 2021.<sup>19</sup> For both *Reporting Indirect Crypto* and *Reporting Virtual Checkbox* taxpayers, the number of taxpayers in the earlier part of our sample is low, by definition. The number of cryptocurrency-related investment funds and trusts has only grown in recent years—for example, Bitcoin exchange-traded funds were first approved in 2024, after our sample period. Similarly, the virtual currency question was added to tax returns starting in 2019.

In Figure 1 Panel B, we directly compare *Reporting Crypto Sellers* to *Reporting Non-Crypto Investors* over time. We focus on *Reporting Crypto Sellers*, as they have a full-time series of data which to compare. The mean (standard deviation) age of *Reporting Crypto Sellers* has markedly decreased over time, from 45.2(18.6) in 2013 to 34.1(11.1) in 2021. The average *Taxable Income* of *Reporting Crypto Sellers* has decreased over time with a marked decline after 2017, from an average of \$296,000 in 2013 to only \$94,000 in 2021. This change is particularly striking

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<sup>18</sup> The number of *Virtual Checkbox* taxpayers is large. Although these taxpayers indicate they have cryptocurrency, we do not observe their transactions directly. Taxpayers may report cryptocurrency in ways that are not identifiable on tax returns (e.g., as miscellaneous income, where there is no description), may engage in cryptocurrency transactions that are not reportable, or may not engage in Bitcoin or Ethereum transactions. The relative similarity between *Reporting Virtual Checkbox* taxpayers and *Reporting Crypto Sellers* suggests that, even though our textual analysis of tax forms may miss some cryptocurrency-related taxpayers, our inferences may be more generalizable to all taxpayers who are willing to report some cryptocurrency information to the IRS. We examine the virtual currency checkbox in more detail in Online Appendix B.

<sup>19</sup> This pattern is consistent with survey evidence, which found that, in 2020, 26% of users had acquired their cryptocurrency within the last year, 68% had acquired it within the last two years, and only 4% had acquired their cryptocurrency over five years ago (State of Crypto Literacy Report 2021).

because, in the early part of our sample period (before 2018), *Reporting Crypto Sellers* had more income than *Reporting Non-Crypto Investors*, and this trend held even at the median.

In Figure 1 Panel C, we examine the characteristics of cryptocurrency transactions over time using data from Form 8949.<sup>20</sup> First, we examine the average cryptocurrency gain taxpayers report by summing up the gains of cryptocurrency transactions reported on Form 8949. We find the average gain was the largest in 2017. This finding may be expected as, in 2017, Bitcoin saw its first price spike, reaching highs of nearly \$20,000 (Higgins 2017). We then see the average gain drop as the price of Bitcoin fell after 2017. Finally, we begin to see another spike in average gain in 2021 as the price rose again. When we examine the average holding period, we see a precipitous drop in 2017. This pattern coincides with the vast increase in the number of taxpayers reporting cryptocurrency, supporting the notion that new taxpayers were investing in cryptocurrency rather than older reporting taxpayers simply selling cryptocurrency.

#### **4. Who reports cryptocurrency sales to the IRS?**

A central question in our setting is whether the taxpayers we observe represent the broader population of cryptocurrency owners. By definition, we only observe what taxpayers report to the IRS, either because they choose to report or are reported by a third party. If taxpayers are not required to file returns, choose not to file, or file in such a way that cryptocurrency sales are not obvious, we will have a nonrandom sample of cryptocurrency investors. Thus, we employ several strategies to quantify the possible magnitude of cryptocurrency investors for whom we do not observe data. First, we examine cryptocurrency volume reported on tax forms compared to Bitcoin blockchain volume. Second, we compare our population size with estimates from surveys, academic studies, and public company reporting. Third, we use the introduction of the virtual

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<sup>20</sup> We use Form 8949 because third-party reporting on Form 1099-B is non-existent or minimal for the earlier half of our sample period.

currency question in 2019 as a shock to IRS scrutiny of cryptocurrency and examine how it affects cryptocurrency reporting among taxpayers who may have weaker reporting incentives.

#### *4.1 IRS-reported cryptocurrency volume*

In Figure 2, we examine how our sample relates to Bitcoin activity. As Bitcoin is the largest, oldest, and best-known cryptocurrency, we use it as a proxy for the overall cryptocurrency environment. We use two measures of IRS-reported volume: (i) sales proceeds reported on Form 1099-B by third parties and (ii) sales proceeds reported by taxpayers on Form 8949. Given that much Bitcoin volume is likely international, one would expect Bitcoin volume to be much larger, even with perfect identification of cryptocurrency transactions on tax returns. Indeed, we observe that IRS reported volume is generally a small fraction of Bitcoin volume, with IRS-reported volume staying relatively constant prior to 2021, even when there were significant spikes in Bitcoin volume. This figure provides initial evidence that there is likely significant underreporting of cryptocurrency transactions to tax authorities.

#### *4.2 Comparison of IRS sample size to non-IRS data*

We next compare our estimates to several outside sources. We begin by examining recent survey evidence on cryptocurrency ownership, then move to academic evidence, and finally estimate the number of cryptocurrency users using public financial reporting information of the largest U.S. cryptocurrency exchange. We appear to observe between 32 percent and 56 percent of U.S. cryptocurrency owners. Based on income, we observe that reporting follows an inverted U-shaped distribution. The highest proportion of reporting cryptocurrency owners falls in the middle of the income distribution, while reporting is lower for taxpayers with under \$25,000 of income and those above \$100,000 of income.

In Table 2 Panel A, we compare the number of taxpayers who we identify as owning some cryptocurrency to five non-IRS estimates of the U.S. cryptocurrency population: the Federal Reserve’s Economic Wellbeing of U.S. Households in 2021 survey, the Pew Research Center’s American Trends Panel survey, the YouGov Cryptocurrency survey, Aiello et al. (2024), and our own calculation of U.S. Cryptocurrency owners using data from Coinbase’s public filings. These sources generally find between 12 percent and 21 percent of the U.S. adult population has owned cryptocurrency. Using census data as a benchmark, we estimate cryptocurrency ownership between 31 million and 54.3 million U.S. Adults.<sup>21</sup>

We compare these estimates to our sample of IRS-reporting cryptocurrency owners. We begin by counting the number of *Reporting Crypto Investors*. As surveys occur at the individual level but tax returns may be filed jointly with a spouse, we count each spouse separately. Both spouses are considered cryptocurrency owners if a tax return reports any cryptocurrency. Using this approach, we identify nearly 17.4 million unique individuals who report cryptocurrency to the IRS on their tax returns during our sample period, equating to about 6.5 percent of the 268.9 million unique individuals we observe between 2013 and 2021. Comparing these estimates to public data suggests we capture between 32 percent and 56 percent of the total U.S. cryptocurrency population, suggesting we observe only a subset of that population.<sup>22</sup>

In Panel B, we use data from the Federal Reserve’s survey to break down cryptocurrency ownership by income to observe whether the nonreporting cryptocurrency population is evenly distributed among our sample. We find that, while there are significant missing populations among all groups, the IRS-reported cryptocurrency ownership percentage is only 50 percent of the survey-

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<sup>21</sup> The total population recorded in the 2020 U.S. Census was 331.4 million (Blakeslee et. al. 2023). We then subtract the portion of the population that is under 18 (73.1 million) to get an estimate of the number of U.S. adults. We then multiply the number of total U.S. adults with the percentage of cryptocurrency owners reported in each survey.

<sup>22</sup> This calculation uses Table 2 Panel A Column (4) divided by Column (3).

reported cryptocurrency ownership percentage for the lowest reported incomes (less than \$25,000 in income). It then rises to between 70 percent (for incomes between \$25,000–\$49,000) and 72 percent (for incomes between \$50,000–\$99,999) for the two groups of middle incomes. Finally, it drops to 62 percent (for incomes greater than \$100,000) for the highest income.<sup>23</sup> For the lowest income taxpayers, the lower ratio of IRS reporting cryptocurrency owners is likely due to several overlapping effects: (i) lower income individuals are less likely to have to file tax returns and thus may not be in our data for benign reasons; (ii) they may be unaware of the reporting requirements, even when they do file a return; or (iii) they may intentionally be avoiding tax on their cryptocurrency sales. We are unable to separate these reasons from each other. Perhaps more interesting is the lower ratio of IRS-reporting cryptocurrency owners at the top of the income band. These taxpayers are more likely to be required to file returns and may be more sophisticated. However, the missing IRS-reporting cryptocurrency owners could be a sign that higher income taxpayers use cryptocurrency in ways that are likely to avoid tax reporting (De Simone et al. 2024). Ultimately, although we can identify much of the U.S. cryptocurrency owner population, our results should only be interpreted as identifying the characteristics of the subset of individuals who report their cryptocurrency gains to the IRS.<sup>24</sup>

#### *4.3 Virtual currency checkbox*

As we noted in Section 3, the IRS introduced the virtual currency question to tax returns starting in 2019. Highlighting the importance of the question and cryptocurrency to the IRS, the question was moved to Form 1040 itself in 2020. On Form 1040 for 2020 and later, the question

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<sup>23</sup> We report the percentage based on the dividing Table 2 Panel B Column (2) by Table 2 Panel B Column (1). We further note that, since the Federal Reserve Survey reported the lowest percentage of cryptocurrency ownership in the United States, these number likely represent the upper range of reporting.

<sup>24</sup> In Online Appendix D, we also examine the geographic dispersion of IRS reported cryptocurrency sales compared to non-IRS data.

is the first item that taxpayers must respond to after entering their identifying information. If the introduction of the checkbox signaled to taxpayers that the IRS would be more focused on cryptocurrency reporting for taxes or if it reminded taxpayers that cryptocurrency sales were taxable, then we should expect more reporting after the checkbox’s introduction in 2019.<sup>25</sup>

We test whether the addition of the virtual currency question resulted in greater cryptocurrency reporting on a subset of taxpayers for whom the checkbox should have had the largest effect. We conduct a difference-in-differences analysis using the pre- and post-virtual currency question as our time variation. To separate our treatment and control samples, we examine whether a tax return had a paid preparer or was *Self Prepared* (*Paid Preparer* = 0). Taxpayers with paid preparers receive professional help with their returns and thus are more likely to know about cryptocurrency reporting rules. Our variable of interest is *Post* × *Self Prepared*, which captures the likelihood that a self-prepared return reported cryptocurrency in 2019 and afterward. We use the following linear probability model:

$$\begin{aligned}
 \text{Only Form 8949 Crypto} = & \alpha + \beta_1 \text{Post} + \beta_2 \text{Self Prepared}_t + \\
 & \beta_3 \text{Post} \times \text{Self Prepared}_t + \beta_4 \text{Indirect Crypto}_t + \beta_5 \text{Ln(Interest)}_t + \\
 & \beta_6 \text{Ln(Dividend)}_t + \beta_7 \text{Student}_t + \beta_8 \text{Homeowner}_t + \beta_9 \text{Sch A}_t + \\
 & \beta_{10} \text{Gambler}_t + \beta_{11} \text{EIC}_t + \beta_{12} \text{Married}_t + \beta_{13} \text{Single Male}_t + \\
 & \beta_k \text{Age Group}_t + \varepsilon_t
 \end{aligned} \tag{1}$$

Our dependent variable, *Only Form 8949 Crypto*, is equal to one if the taxpayer reports a cryptocurrency transaction on Form 8949 but does not receive any third-party reporting related to cryptocurrency transactions.<sup>26</sup> We include the natural log of both *Interest* and *Dividend* income to control for how the presences of other forms of investment income influence the sale and reporting

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<sup>25</sup> We present descriptive statistics related to *Virtual Checkbox* reporting in Online Appendix B.

<sup>26</sup> We limit our coding of the dependent variable to those reporting cryptocurrency voluntarily and not as the result of third-party reporting. Third-party reporting has been shown to have large compliance effects (Kleven et al. 2011), so those already subject to third-party reporting would be more likely to be already compliant and unlikely to respond to the treatment (even if involuntarily).

of cryptocurrency.<sup>27</sup> We include *Student* to capture potentially differing socioeconomic status and education level. We include *Homeowner* to capture potentially differing asset values or net worths. We include an indicator for gambling income (*Gambler*) to control for other types of risky behavior. We include an indicator for the earned income credit (*EIC*) as low-income taxpayers may have different filing and reporting incentives. We also control for whether the taxpayer also holds cryptocurrency-related stocks and investments (*Indirect Crypto*). Finally, we include a variety of demographic characteristics (*Married*, *Single Male*, and *Age Group*) as surveys have found differences in cryptocurrency ownership across various demographic characteristics. Due to the size of our dataset (starting with well over a billion observations), in the IRS environment, we are unable to run a regression analysis on our full sample. To address this issue, we begin by taking a random sample of 10 million tax returns from the population of tax returns that has data available for the regressions. We repeat each random sampling process 10 times and average the coefficients, standard errors, and adjusted R-squared from the models to report in Table 3. We also report the number of coefficients (out of 10) that are significant at the 1% level.

In Table 3, we present the results of equation (1). We find that the coefficient on *Post* is positive and significant across all iterations ( $p < 0.01$ ). The coefficient on *Self Prepared* is near zero and is generally insignificant across iterations. The interaction term,  $Post \times Self Prepared$ , is positive and significant in seven of 10 iterations ( $p < 0.05$ ). Although the magnitude of the average coefficient is small (0.0002) in absolute terms, with the baseline probability of a taxpayer reporting cryptocurrency of only 0.12 percent (untabulated), the average coefficient suggests that reporting

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<sup>27</sup> We specifically avoid using *Taxable Income* due to the fact that cryptocurrency gains are a part of *Taxable Income*, and we avoid *Capital Gain* for the same reason. If we were to try to remove cryptocurrency gains from income mechanically by subtracting them out, the variable would lose interpretability if there were other losses included on the return, as IRS rules do not allow taxable income to go below zero or capital gain to go below -\$3,000 [[This is a great example of the distinction I was making—the IRS has no opinion on your variables, only on actual tax income and capital gains]].

may increase by as much as 16 percent (0.0002 / 0.0012). This evidence weakly suggests that the checkbox may have induced some taxpayers without tax advisors to report their cryptocurrency sales.

## **5. Sophistication of *reporting crypto sellers***

We next turn our attention to examining the sophistication of *Reporting Crypto Sellers*. We focus on this group for two reasons. First, unlike *Reporting Indirect Crypto* taxpayers, *Reporting Crypto Sellers* are reporting cryptocurrency transactions from cryptocurrency held directly, which may differ from the reporting of traditional securities (like *Reporting Indirect Crypto*). Also, *Reporting Crypto Sellers* allows us to examine the portfolios and trading of taxpayers, which is unavailable for *Reporting Virtual Checkbox* taxpayers. We first examine the characteristics that make taxpayers likely to be *Reporting Crypto Sellers*. We then move on to whether *Reporting Crypto Sellers* pursue tax-motivated transaction planning, consistent with their being more sophisticated investors. Finally, we examine whether *Reporting Crypto Sellers* resemble traditional security investors more generally.

### *5.1 Characteristics of reporting crypto sellers*

#### *5.1.1 Probability of reporting cryptocurrency sales*

We model the probability of becoming a *Reporting Crypto Seller* using a discrete-time hazard model (Allison 2011). We begin our analysis by limiting our sample to taxpayers who report at least one cryptocurrency sale during our sample period and have a full nine years of tax return data to ensure that we have a full history of their tax filings and limit right-tailed censoring before 2021. We end with a sample of 3,771,561 *Reporting Crypto Sellers*. We then match each *Reporting Crypto Seller* to a taxpayer who does not sell cryptocurrency at any time during our sample period. We match exactly on the state of residence, filing status (married/female

single/male single), and age. We also match based on the within-year percentile rank of *Wages*. Our large sample allows us to match each *Reporting Crypto Seller* one to one with another taxpayer who does not sell cryptocurrency during our sample period. We limit *Reporting Crypto Seller* observations to those before the first cryptocurrency sale and only the first year in which a cryptocurrency sale is reported to avoid unduly influencing the model coefficients (Allison 1984).

We estimate the following discrete-time hazard model:

$$\begin{aligned}
 \text{Ln} \left[ \frac{P_{\text{Crypto}}}{1 - P_{\text{Crypto}}} \right] &= \alpha + \beta_1 \text{Ln}(\text{Interest})_t + \beta_2 \text{Ln}(\text{Dividend})_t + \beta_3 \text{Student}_t \\
 &+ \beta_4 \text{Homeowner}_t + \beta_5 \text{Sch A}_t + \beta_8 \text{Gambler}_t + \beta_9 \text{EIC}_t \\
 &+ \beta_{10} \text{Indirect Crypto}_t + \beta_{11} \text{Paid Preparer}_t + \delta + \varepsilon_t \quad (2)
 \end{aligned}$$

We include a variety of controls for tax return characteristics as defined in Appendix A. We include similar controls as those in equation (1), omitting controls where we have matched on the specific variables. We also include year fixed effects ( $\delta$ ) to help control for the significant time trends in cryptocurrency reporting.

We present the results of our regression in Table 4. The coefficient on *Indirect Crypto* is negative and significant, indicating indirectly holding cryptocurrency may substitute for owning it directly ( $p < 0.01$ ). Risk preference may also influence the reporting of cryptocurrency, as being a *Gambler* relates positively to *Reporting Crypto Seller* ( $p < 0.01$ ). We also find that being a *Student*, or being a *Homeowner*,  $\text{Ln}(\text{Dividends})$ , or including *Sch A* on your tax return each has a positive association with reporting cryptocurrency while reporting  $\text{Ln}(\text{Interest})$ , *EIC*, and having a *Paid Preparer* are all negatively associated with becoming a *Reporting Crypto Seller*. As a robustness check, we also use a linear probability model to examine the relation between taxpayer characteristics and *Reporting Crypto Sellers* (untabulated). We generally find consistent results

with the hazard model with the following differences. In the linear probability model, *Indirect Crypto* and  $\text{Ln}(\text{Interest})$  have positive coefficients, while *Sch A* has a negative coefficient.

### 5.1.2 Investor trading

In our last set of tests examining the characteristics of those who report cryptocurrency sales to the IRS, we examine how that reporting is associated with underlying investment characteristics and whether that relationship changes between investment types. We sum IRS reported trading volume (*IRS Volume*), defined as the number of transactions reported on Form 1099-B at the security-month-year level. Using data from CRSP, we match firms in the IRS data by CUSIP to daily stock return data. We then create two measures of stock characteristics at the security-month-year level. *Average Ret* is the average daily return for a security for each month. *Std Dev Of Returns* is the standard deviation of daily returns at the security-month-year level. *Negative Return* is equal to 1 if *Average Ret* is negative to account for potential differential responses between months with overall gains versus months with overall losses. We merge in Bitcoin daily price data and construct the same variables for Bitcoin. Finally, we also examine a set of stocks that have been noted to resemble cryptocurrency, meme stocks. *Meme Stock* is an indicator equal to one if a stock is identified as a meme stock for 2021. We define *Meme Stock* if they are identified as meme stocks by either Chacon, Morillon, and Wang (2022) or Hu, Jones, Zhang, and Zhang (2023).<sup>28</sup> We examine the robustness of our results to including year fixed effects and year×month fixed effects. We measure all variables in the same month, testing the link between the number of sales reported to the IRS for a given security-month-year, compared with the average return and volatility for that same security-month-year.

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<sup>28</sup> We go into more detail in Section 5.3 about the differences between Chacon, Morillon, and Wang (2022) and Hu, Jones, Zhang, and Zhang (2023)

In Table 5, we find that, for traditional stocks, there is generally higher *IRS Volume* when *Average Returns* are higher and lower reported volume when *Std Dev Of Returns* are higher. The relation between *Negative Return* and *IRS Volume* flips from positive to negative, depending on the fixed effects. When examining *Cryptocurrency*, we find that the coefficient on *Cryptocurrency*×*Average Daily Return* is negative but insignificant in all specifications.<sup>29</sup> In Column (1), we find a significant and positive coefficient on *Cryptocurrency*×*Monthly Std. Dev. Of Returns*. However, this result depends on fixed effects. This evidence is consistent with *Reporting Crypto Sellers* taking advantage of favorable wash sale rules, although it is indirect evidence (Cong et al. 2023). *Meme stocks* also appear to differ from traditional stocks. Similar to *Cryptocurrency*, the coefficient on *Meme Stock*×*Average Return* is negative and significant in all columns, indicating fewer reported sales when returns rise. In all three columns, the coefficient on *Meme Stock*×*Std Dev Of Returns* is positive and significant, indicating that greater volatility results in greater reporting of sales to the IRS.

We also examine a specific set of *Reporting Crypto Sellers* who report large (greater than \$1,000,000) gains from cryptocurrency. We compare them to taxpayers who have large (greater than \$1,000,000) gains from either traditional stocks or gambling. In all three cases, we find that taxable income in the two years after the large gain continues to be higher than taxable income two years before the gain, with cryptocurrency having the largest persistence. We also find that, after a large cryptocurrency gain, taxpayers report selling more unique stocks, more stock transactions, and higher sales proceeds from stock transactions, potentially indicating greater investment diversification.<sup>30</sup>

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<sup>29</sup> As we group all cryptocurrency together, this regression has only 108 observations where *Cryptocurrency Ind* is equal 1, potentially limiting our power to identify significant results.

<sup>30</sup> We tabulate the results of these tests in Online Appendix E.

## 5.2 Tax sophistication

We now examine the level of financial sophistication of *Reporting Crypto Sellers*. One form of sophistication is tax sophistication. Cryptocurrency has been noted by the media to pose a significant risk of tax evasion (Iacurci 2021). De Simone et al. (2024) show how some cryptocurrency investors can avoid taxable transactions using decentralized finance. Under this theory, the only investors who report to the IRS may be unsophisticated investors who do not understand tax law and are unwilling to commit tax fraud. On the other hand, Cong et al. (2023) show that U.S. taxpayers may take advantage of unique and (currently) legal tax loss harvesting opportunities that only exist with cryptocurrency. However, this strategy is only beneficial if taxpayers report their cryptocurrency sales, suggesting some sophisticated taxpayers report their cryptocurrency sales.<sup>31</sup>

Changes in tax rates have long been known to result in changes in taxpayer behavior (Feldstein 1995). Saez (2010) operationalizes this construct by examining bunching around tax rate changes. These behavioral responses require taxpayers to have the ability and incentive to manipulate their income. Under U.S. tax law, property held greater than one year receives preferential tax rates on recognized gains; unrecognized gains are deferred. Taxpayers also have an incentive to hold capital assets for at least one year to reduce the taxes paid on the ultimate gain.<sup>32</sup> Absent other considerations, taxpayers would prefer to sell capital assets after holding them for more than 365 days. Dowd and McClelland (2019) show that there is a significant bunching of

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<sup>31</sup> Although the wash sale rules do not currently apply to cryptocurrency, some taxpayers provide descriptions on Form 8949 indicating wash sale adjustments related to cryptocurrency. Although the number of taxpayers is small, this does indicate that there may be some heterogeneity in the reporting of cryptocurrency sales as it relates to wash sale adjustments.

<sup>32</sup> For a taxpayer in the highest individual tax bracket, short-term gains are taxed at 40.8% (37% ordinary rate plus the 3.8% net investment income tax), while sales of assets held for more than one year have a maximum rate of 23.8% in most cases. In the most extreme cases, an individual selling an asset one day later can result in a greater than 40% reduction in tax on that sale.

taxable gains around the 52-week holding period that defines the lower long-term capital gains tax rate. We build on this study by examining the tax sensitivity of cryptocurrency gains to the long-term holding period and comparing the sensitivity with that of traditional securities. We expect that, if *Reporting Crypto Sellers* are more tax sophisticated, they will exhibit the bunching behavior found in traditional securities. If *Reporting Crypto Sellers* are unsophisticated and unaware of specific tax rate changes, then we should expect no response around the 52-week long-term capital gain holding period.

In Figure 3, we graph the total gains for stocks held by *Reporting Non-Crypto Investors*, stocks held by *Reporting Crypto Sellers*, and cryptocurrency reported on Form 1099-B over our sample period for holding periods between 42 and 62 weeks.<sup>33</sup> We limit our analysis to profitable transactions, as the timing incentives for losses are less clear. To calculate the total gain, we calculate the holding period for each transaction in weeks, rounding down.<sup>34</sup> If taxpayers are tax sophisticated, we expect a large spike in reported gains at week 52. Due to the relatively small amount of cryptocurrency gains recognized by taxpayers, our estimates may be prone to large spikes if a single or small group of taxpayers make large sales for reasons unrelated to taxes. To account for this fact, in addition to total gain recognized, we also proxy for the number sales using the number of 1099-B filings. Thus, each 1099-B is weighted equally, and the resulting total is less likely to be influenced by a single large sale. To make figures comparable, we scale all amounts by the volume in Week 51 such that every point at Week 51 is one, by construction. For each year, we examine three figures. First, we examine sales of traditional securities by *Reporting*

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<sup>33</sup> For this analysis, we require that the Form 1099-B list a valid, nonmissing buy date and sell date to calculate the holding period. We do not use Form 8949, as taxpayers will often summarize transactions or list the buy date as “various” and the sell date as either various or “12/31/XX,” rather than specifying the actual buy and sell dates of each transaction.

<sup>34</sup> We ensure that, for each stock, the minimum holding period to be assessed as long-term capital gain is at least one full year plus one day, in line with IRS rules.

*Non-Crypto Investors* to see whether *Reporting Crypto Sellers* behave differently than other investors. Second, we examine *Reporting Crypto Sellers* sales of traditional securities to examine whether *Reporting Crypto Sellers* treat cryptocurrency differently than traditional assets. Finally, we examine *Reporting Crypto Sellers* sales of cryptocurrency-related assets.

In Columns (1) and (2), we find, across all three years, that there is a strong tax sensitivity to the long-term capital gains holding period for both *Reporting Non-Crypto Investors* and *Reporting Crypto Sellers* for traditional securities. We see large spikes in both the amount of gain recognized and in the number of transactions reported at the 52-week threshold, indicating both *Reporting Non-Crypto Investors* and *Reporting Crypto Sellers* time their capital gains in traditional stocks. When examining cryptocurrency sales, we fail to find tax sensitivity of cryptocurrency sales to tax incentives. In fact, we find that there are small spikes at the 51-week holding period, indicating taxpayers sell immediately before the long-term capital gain holding period. Upon closer inspection of the data, a significant number of taxpayers report purchases of cryptocurrency on January 1 and December 31 (Jan-Dec Sales) of the year. Between 39.6 and 92.6 percent of the number of transactions and between 30.5 and 96.5 percent of the total gain reported in week 51 are Jan-Dec Sales.<sup>35</sup> When removing these sales, we see spikes in week 52 for both measures across all three years, except for the total amount of gain reported in 2019. We note these spikes are still relatively small, with the largest being only 2.2 times the week 51 amount (untabulated). This continues to indicate smaller tax sensitivities for cryptocurrency than for traditional stocks.

Together, it appears that *Reporting Crypto Sellers* may treat cryptocurrency transactions differently than traditional securities when deciding when to buy and sell, and that the lack of a

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<sup>35</sup> We do not have an explanation for the large number of Jan-Dec Sales reported. As these transactions are based on 1099-B filings, they should be orthogonal to taxpayer misreporting of dates, but since 1099-B reporting for cryptocurrency is voluntary, there may still be reporting irregularities. Alternatively, it could be that cryptocurrency sellers are simply much more likely to buy cryptocurrency on January 1 and sell it on December 31.

52-week spike may not necessarily mean that *Reporting Crypto Sellers* are unsophisticated. In untabulated tests, we also examine the relation between several stock and taxpayer characteristics and the tax sensitivity of investors. We find that samples split at the median for monthly stock returns, monthly stock volatility, taxpayer income, and sample splits for taxpayers above age 30 all show discontinuities for traditional securities at the 52-week mark for both *Reporting Non-Crypto Investors* and *Reporting Crypto Sellers*. This shows that the phenomena we document is likely unique to cryptocurrency and unrelated to taxpayer or security characteristics.

### 5.3 Meme stock holdings

We finally examine investor sophistication more generally by examining another investment decision by *Reporting Crypto Sellers*, meme stock holdings. In early 2021, retail investors drove large gains in the price of several stocks. Rather than fundamentals or news, the increased value of meme stocks was driven by momentum and sentiment of retail investors, who talked about stocks online, primarily on the Reddit subreddit Wallstreetbets (Lam, Benedict, and Rivas 2021).<sup>36</sup> *The Wall Street Journal* notes that the top holding of the MEME ETF is Riot Blockchain, a cryptocurrency mining company (Wallerstien 2023). Costola, Iacopini, and Santagiustina (2021) create a model to identify meme stock momentum and note that it resembles market manipulation in cryptocurrency markets. More directly, Yousef, Pham, and Goodell (2022) and Aloosh, Ouzan, and Shahzad (2022) note the price co-movement between meme stocks and cryptocurrency.

As there is no single definition of a meme stock, we examine two. First, we use a list of the top 10 stocks mentioned on the Wallstreetbets subreddit in 2021 as calculated by Chacon,

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<sup>36</sup> Reddit.com is an online message board community. Users can create “subreddits,” which act as dedicated areas for certain groups of individuals to communicate by posting content and replying to each other. The WallStreetBets subreddit is a community for talking about stocks and investing and has been widely seen as a key driver behind the retail trading that resulted in the meme stock frenzy in 2021.

Morillon, and Wang (2022), which we label as CMW Meme Stocks. Chacon et al. (2022) use textual analysis to identify the most mentioned stocks in submissions to the subreddit. Second, we follow Hu, Jones, Zhang, and Zhang (2023) and use a set of 50 firms that Robinhood announced trading restrictions for on January 28, 2021. We label these firms as HJZZ Meme Stocks. These two lists of stocks share significant overlap, with five of the CMW Meme Stocks appearing on the Robinhood list. Both lists also include stocks that received significant media attention, such as Gamestop Inc. and AMC Entertainment. We use six-digit CUSIPs to match IRS form 1099-B to each list of meme stocks. We limit our analysis to the tax year 2021, the only year in our sample period that overlaps with the emphasis on these securities as meme stocks.

We first examine the equity portfolios of *Reporting Crypto Sellers* versus *Reporting Non-Crypto Investors* using form 1099-B reporting. In Figure 4, we present the percentage of a taxpayer's traditional stock sales reported on Form 1099-B are meme stocks using both definitions of meme stock and both an equal-weighted and a volume-weighted measure. We find consistent results in all four cases—*Reporting Crypto Sellers* are more likely to sell meme stocks than *Reporting Non-Crypto Investors*.

In Table 6, we examine whether, controlling for other factors, *Reporting Crypto Sellers* are more likely to hold meme stocks than *Reporting Non-Crypto Investors*. Our sample consists of 27,487,574 taxpayer-year observations with stock sales reported on Form 1099-B and nonmissing data for all regression variables in the 2021 tax year. We report descriptive statistics for our sample in the Online Appendix B. To examine the question of whether *Reporting Crypto Sellers* hold more meme stocks than *Reporting Non-Crypto Investors*, we use the following OLS regression:

### *Meme Stock Sales*

$$\begin{aligned} &= \alpha + \beta_1 \textit{Reporting Crypto Seller}_t + \beta_2 \textit{Indirect Crypto}_t \\ &+ \beta_3 \textit{Ln(Interest)}_t + \beta_4 \textit{Ln(Dividend)}_t + \beta_5 \textit{Ln(Wages)}_t \\ &+ \beta_6 \textit{Student}_t + \beta_7 \textit{Homeowner}_t + \beta_8 \textit{Sch A}_t + \beta_0 \textit{Gambler}_t \\ &+ \beta_{10} \textit{EIC}_t + \beta_{11} \textit{Paid Preparer}_t + \beta_{12} \textit{Married}_t \\ &+ \beta_{13} \textit{Single Male}_t + \beta_k \textit{Age Group}_t + \varepsilon_t. \end{aligned} \quad (3)$$

*Meme Stock Sales* is one of four variables and represents the proportion of taxpayers' sales reported on Form 1099-B that were meme stocks. In Columns (1) and (2) of Table 6, we define meme stocks using the CMW Meme Stocks, while in Columns (3) and (4), we use the HJZZ Meme Stock definition. In both cases, we examine both an equal-weighted (number of unique meme stocks divided by the number of unique stocks) and volume-weighted (sales proceeds of meme stock sales over the total sales proceeds of all stock sales). We control for other factors, making the interpretation of  $\beta_l$  conditional on a number of other taxpayer characteristics. All variables are defined in Appendix A. Due to limitations in the IRS computing environment, we run the regression using a random sample of 10 million taxpayer years. We repeat this sampling process 10 times and report the average of the coefficients and standard errors in Table 6. We also report how many (out of 10) coefficients were significant at the 1 percent level.

We find that *Reporting Crypto Sellers* are significantly more likely to have a larger percentage of their portfolio in meme stocks. Across all four columns, the coefficient on *Reporting Crypto Seller* is positive and significant in all iterations. On average, between 2.5 percent (Column 2) and 5.8 percent (Column 3) more of *Reporting Crypto Seller*'s sales of stocks are meme stocks, even after controlling for various demographic characteristics. (We are not just documenting that, for example, younger people own both meme stocks and crypto.) We also find that taxpayers who are younger, a *Student*, *Single Male*, or a *Gambler* sell more meme stocks and that other investment income ( $\text{Ln(Dividends)}$  and  $\text{Ln(Interest)}$ ), having itemized deductions (*Sch A*) and having a *Paid*

*Preparer* are negatively associated with selling meme stocks. Both of these observations support the idea that meme stock investors are generally less sophisticated.

Although we do not provide causal evidence that cryptocurrency sales cause meme stock sales, we show that *Reporting Crypto Sellers* hold different noncryptocurrency investments than *Reporting Non-Crypto Investors* and that these differences align with indirect evidence of the similarities between cryptocurrency and other stocks as noted in the literature (Yousef et al. 2022; Aloosh et al. 2022). This initial evidence should be of interest as regulators and investors examine the impact of future regulated securities products, such as Bitcoin ETFs. This information may also be useful to investors who seek to diversify their holdings, as having the same investors hold the same stocks can create co-movement between the stocks if the investor group suffers a shock.

## **6. Conclusion**

We use U.S. population-level administrative tax data to identify *Reporting Crypto Sellers*, taxpayers who both sell cryptocurrency and, in some way, report those sales to the IRS. We begin by benchmarking our *Reporting Crypto Seller* population to non-IRS estimates of the cryptocurrency population, finding that only between 32 percent and 56 percent of cryptocurrency holders may be reporting gains to the IRS and that this population is rapidly growing. We find that these reporters are younger and poorer than other investors. We find that the reporting of cryptocurrency transactions after the introduction of the virtual currency checkbox increased and that *Reporting Crypto Sellers'* cryptocurrency transactions are less sensitive to long-term capital gain incentives, suggesting a difference between cryptocurrency and traditional stocks. However, we also find that the trading of *Reporting Crypto Sellers* resembles that of *Meme Stocks* investors and that *Reporting Crypto Sellers* also sell more meme stocks than other investors. Overall, we paint a nuanced picture of *Reporting Crypto Sellers*. The most consistent takeaway from our results

is that *Reporting Crypto Sellers* continue to evolve, in their characteristics, investment decisions, and tax sophistication.

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## References

- Aiello, D., S. Baker, T. Balyuk, M. Di Maggio, M. Johnson, and J. Kotter. 2023. *The effects of cryptocurrency wealth on household consumption and investment*. National Bureau of Economic Research No. w31445.
- Allison, P. D. 1984. *Event History Analysis: Regression for Longitudinal Event Data*. Beverly Hills: Sage.
- Allison, P. D. 2011. *Survival Analysis Using SAS: A Practical Guide*. SAS Institute.
- Aloosh, A., S. Ouzan, and S. J. H. Shahzad. 2022. Bubbles across meme stocks and cryptocurrencies. *Finance Research Letters* 49: 103155.
- Amiram, D., B. N. Jørgensen, and D. Rabetti. 2022. Coins for bombs: The predictive ability of on-chain transfers for terrorist attacks. *Journal of Accounting Research* 60 (2): 27–466.
- Arnosti, N., and S. M. Weinberg. 2022. Bitcoin: A Natural Oligopoly. *Management Science*. 68 (7): 4755–4771
- Athey, S., I. Parashkevov, V. Sarukkai, and J. Xia. 2016. Bitcoin Pricing, Adoption, and Usage: Theory and Evidence. Working Paper.  
[https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2826674](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2826674)
- Ballard, J. 2018. Most Americans Are Familiar with at Least One Kind of Cryptocurrency. *YouGov*.  
<https://today.yougov.com/technology/articles/21509-cryptocurrency-bitcoin-popular-americans>. Accessed September 19, 2025.
- Bankman, J., C. Nass, and J. Slemrod. 2015. Using the 'Smart Return' to Reduce Tax Evasion. In *Proceedings. Annual Conference on Taxation and Minutes of the Annual Meeting of the National Tax Association*, vol. 108, 1–23. National Tax Association.
- Baydakova, A. 2023. Gary Gensler's Evolving Position on Crypto – in Quotes. *Coindesk*.  
<https://www.coindesk.com/consensus-magazine/2023/06/06/gary-genslers-evolving-position-on-crypto-in-quotes/> Accessed December 30, 2023.
- Benetton, M., and G. Compiani. 2024. Investors' Beliefs and Cryptocurrency Prices. *The Review of Asset Pricing Studies* 14 (2): 197–236.
- Blakeslee, L., Z. Caplan, J. Meyer, M. Rabe, and A. Roberts. 2023. Age and Sex Composition: 2020. *2020 Census Briefs*. <https://www2.census.gov/library/publications/decennial/2020/census-briefs/c2020br-06.pdf>. Accessed September 19, 2025.
- Bourveau, T., E. T. De George, A. Ellahie, and D. Macciocchi. 2022. The Role of Disclosure and Information Intermediaries in an Unregulated Capital Market: Evidence from Initial Coin Offerings. *Journal of Accounting Research* 60 (1): 129–167.
- Cadwalader, Wickersham & Taft LLP 2023. Treasury delivers Mother Lode of tax reporting rules to the crypto industry's Doorstep. *The National Law Review*.  
<https://www.natlawreview.com/article/treasury-delivers-mother-lode-tax-reporting-rules-crypto-industrys-doorstep>. Accessed September 19, 2025.
- Cecchini, M., H. Aytug, G. J. Koehler, and P. Pathak. 2010. Detecting Management Fraud in Public Companies. *Management Science* 56 (7): 1146–1160.
- Chacon, R. G., T. G. Morillon, and R. Wang. 2023. Will the Reddit Rebellion Take You to the Moon? Evidence from WallStreetBets. *Financial Markets and Portfolio Management* 37 (1): 1–25.
- Cheng, S. F., G. De Franco, H. Jiang, and P. Lin. 2019. "Riding the Blockchain Mania: Public Firms' Speculative 8-K Disclosures." *Management Science* 65 (12): 5901–5913.
- Coinmarketcap.com. n.d. Coinmarketcap.com <https://coinmarketcap.com/>. Accessed March 28, 2024.

- Cong, L. W., W. Landsman, E. Maydew, and D. Rabetti. 2023. Tax-Loss Harvesting with Cryptocurrencies. *Journal of Accounting and Economics* 76 (2–3): 101607.
- Costola, M., I. Matteo, and C. Santagiustina. 2021. On the 'Momentum' of Meme Stocks. *Economics Letters* 207: 110021.
- De Simone, L., P. Jin, and D. Rabetti. 2024. Tax Avoidance with DeFi Lending. *SSRN Working Paper*. [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=4764605](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4764605).
- Dowd, T., and R. McClelland. 2019. The Bunching of Capital Gains Realizations. *National Tax Journal* 72 (2): 323–358.
- Federal Reserve. 2022a. Federal Reserve Board releases discussion paper that examines pros and cons of a potential U.S. central bank digital currency (CBDC). *Federalreserve.gov*. <https://www.federalreserve.gov/newsevents/pressreleases/other20220120a.htm>. Accessed September 19, 2025.
- Federal Reserve. 2022b. Economic Well-Being of U.S. Households in 2021. *Federal Reserve*. <https://www.federalreserve.gov/publications/files/2021-report-economic-well-being-us-households-202205.pdf>. Accessed September 19, 2025.
- Feldstein, M. 1995. The Effect of Marginal Tax Rates on Taxable Income: A Panel Study of the 1986 Tax Reform Act. *Journal of Political Economy* 103 (3): 551–572.
- Gan, J., G. Tsoukalas, and S. Netessine. 2021. Initial Coin Offerings, Speculation, and Asset Tokenization. *Management Science* 67 (2): 914–931.
- Griffin, J. M., and A. Shams. 2020. Is Bitcoin Really Untethered? *The Journal of Finance* 75 (4): 1913–1964. <http://dx.doi.org/10.1111/jofi.12903>.
- Hackethal, A., T. Hanspal, D. M. Lammer, and K. Rink. 2021. The Characteristics and Portfolio Behavior of Bitcoin Investors: Evidence from Indirect Cryptocurrency Investments. *Review of Finance*. 26 (4): 855–898.
- Hall, Joseph. 2022. Portugal Slowly Becoming a 'Haven' for European Bitcoiners. *Cointelegraph*, <https://cointelegraph.com/news/portugal-slowly-becoming-a-haven-for-european-bitcoiners>. Accessed September 19, 2025.
- Hasso, T., M. Pelster, and B. Breitmayer. 2019. Who Trades Cryptocurrencies, How Do They Trade It, and How Do They Perform? Evidence from Brokerage Accounts. *Journal of Behavioral and Experimental Finance* 23: 64–74.
- Higgins, Stan. 2017. From \$900 to \$20,000: Bitcoin's Historic 2017 Price Run Revisited *CoinDesk*. <https://www.coindesk.com/markets/2017/12/29/from-900-to-20000-bitcoins-historic-2017-price-run-revisited/>. Accessed September 19, 2025.
- Hopkins, J. J., E. L. Maydew, and M. Venkatachalam. 2015. Corporate General Counsel and Financial Reporting Quality. *Management Science* 61 (1): 129–145.
- Hu, D., C. M. Jones, V. Zhang, and X. Zhang. 2021. The Rise of Reddit: How Social Media Affects Retail Investors and Short-Sellers' Roles in Price Discovery. *SSRN Working Paper*. <https://ssrn.com/abstract=3807655>.
- Iacurci, G. 2021. Cryptocurrency poses a significant risk of tax evasion. *CNBC*. <https://www.cnbc.com/2021/05/31/cryptocurrency-poses-a-significant-risk-of-tax-evasion.html>. Accessed September 19, 2025.
- Kleven, H. J., M. B. Knudsen, C. T. Kreiner, S. Pedersen, and E. Saez. 2011. Unwilling or Unable to Cheat? Evidence from a Tax Audit Experiment in Denmark. *Econometrica* 79 (3): 651–692.

- Lam, B., J. Benedict, and A. Rivas. 2021. 'We like the stock!' The Anatomy of a Meme. *Wall Street Journal*. <https://www.wsj.com/articles/we-like-the-stock-the-anatomy-of-a-meme-11612542783>. Accessed September 19, 2025.
- Lei, Y., Y. Li, and J. Xu. 2020. Two Birds, One Stone: Joint Timing of Returns and Capital Gains Taxes. *Management Science* 66 (2): 823–843.
- Li, C., and M. S. Ma. 2024. Is Cryptocurrency the New Haven for Tax Evaders? Exposé of Financial Secrecy in Tax Havens and Bitcoin Trading. *SSRN Working Paper*. [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=4731408](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4731408).
- Makarov, I., and A. Schoar. 2020. Trading and Arbitrage in Cryptocurrency Markets. *Journal of Financial Economics* 135 (2): 293–319.
- Makarov, I., and A. Schoar. 2021. Blockchain Analysis of the Bitcoin Market. *NBER Working Paper* No. w29396. National Bureau of Economic Research.
- Malik, N., M. Aseri, P. V. Singh, and K. Srinivasan. 2022. Why Bitcoin Will Fail to Scale? *Management Science*. 68 (10): 7323–7349.
- Maurer, M. 2022. FASB Targets New Long-Term Agenda, Rules on Expense Disclosure in 2022. *Wall Street Journal*. <https://www.wsj.com/articles/fasb-targets-new-long-term-agenda-rules-on-expense-disclosure-in-2022-11641205806>. Accessed September 19, 2025.
- Meiklejohn, S., M. Pomarole, G. Jordan, K. Levchenko, D. McCoy, G. M. Voelker, and S. Savage. 2013. A Fistful of Bitcoins: Characterizing Payments among Men with No Names. In *Proceedings of the 2013 Conference on Internet Measurement Conference*, 127–140. New York: Association for Computing Machinery.
- Merkley, K. J., J. Pacelli, M. Piorkowski, and B. Williams. 2024. Crypto-Influencers. *Review of Accounting Studies* 29 (3): 2254–2297.
- Nessa, M., C. M. Schwab, B. Stomberg, and E. M. Towery. 2020. How Do IRS Resources Affect the Corporate Audit Process? *The Accounting Review* 95 (2): 311–338. <https://doi.org/10.2308/accr-52520>.
- Moen, R. 2023. Coinbase CEO Criticizes Anti-Crypto Stance of American Politicians. *Blockchain News*. <https://blockchain.news/news/coinbase-ceo-criticizes-anti-crypto-stance-of-american-politicians> Visited 12/30/2023.
- Nakamoto, S. 2008. A peer-to-peer electronic cash system. <https://bitcoin.org/bitcoin.pdf>. Accessed September 19, 2025.
- Pew Research. 2021. American Trends Survey: Politics Timely and Topical. *Pew Research*. <https://www.pewresearch.org/wp-content/uploads/2021/11/Crypto-Methods-Topline.pdf>. Accessed September 19, 2025.
- Quiroz-Gutierrez, M. 2022. Crypto Is Fully Banned in China and 8 Other Countries. *Fortune*. <https://fortune.com/2022/01/04/crypto-banned-china-other-countries/>. Accessed September 19, 2025.
- Robinhood. 2021. An Update on Market Volatility. Available at: <https://newsroom.aboutrobinhood.com/an-update-on-market-volatility>. Accessed September 19, 2025.
- Ron, D., and A. Shamir. 2013. Quantitative Analysis of the Full Bitcoin Transaction Graph. *International Conference on Financial Cryptography and Data Security*, 6-24. Springer, Berlin, Heidelberg.
- Saez, E. 2010. Do Taxpayers Bunch at Kink Points? *American Economic Journal: Economic Policy* 2 (3): 180–212

- Securities and Exchange Commission. 2022. BlockFi Agrees to Pay \$100 Million in Penalties and Pursue Registration of its Crypto Lending Product. *SEC.gov*. <https://www.sec.gov/news/press-release/2022-26>. Accessed September 19, 2025.
- Securities and Exchange Commission. 2020. SEC Charges Ripple and Two Executives with Conducting \$1.3 Billion Unregistered Securities Offering. *SEC.gov*. <https://www.sec.gov/news/press-release/2020-338>. Accessed September 19, 2025.
- Securities and Exchange Commission. 2025. Accredited Investors. Available at: <https://www.sec.gov/resources-small-businesses/capital-raising-building-blocks/accredited-investors>. Accessed January 16, 2025.
- Serino, K. 2024. What another Trump administration could mean for crypto. *PBS*. <https://www.pbs.org/newshour/politics/what-does-a-trump-administration-mean-for-crypto>. Accessed December 12, 2024.
- CorporateLiteracy.org. 2021. State of Crypto Literacy Report. <https://cryptoliteracy.org/wp-content/uploads/2021/10/State-of-Crypto-Literacy.pdf>. Accessed September 19, 2025.
- Telesca, J., and K. Kjellman Schmidt. 2021. GameStop Stock, Reddit and Robinhood: What You Need to Know. *The Wall Street Journal*. <https://www.wsj.com/articles/gamestop-stock-reddit-and-robinhood-what-you-need-to-know-11611960243>. Accessed September 19, 2025.
- Toppa, S. 2023. Crypto.com to Shut Down U.S. Institutional Services after SEC lawsuits Target Industry. *TheStreet.com*. <https://www.thestreet.com/crypto/investing/crypto-com-shuts-down-u-s-crypto-exchange-after-sec-lawsuits-target-industry>. Accessed December 30, 2023.
- Treasury Inspector General for Tax Administration (TIGTA). 2024. Virtual Currency Tax Compliance Enforcement Can Be Improved. [https://www.tigta.gov/sites/default/files/reports/2024-07/2024300030fr\\_0.pdf](https://www.tigta.gov/sites/default/files/reports/2024-07/2024300030fr_0.pdf). Accessed September 19, 2025.
- Valdez, N. 2024. Trump's bold move could make crypto gains tax-free: the 3 U.S. tokens set to skyrocket. *The Street*. <https://finance.yahoo.com/news/trump-bold-move-could-crypto-193455642.html>. Accessed December 12, 2024.
- Versprille, A. 2022. Crypto Firms Brace For New Tax-Reporting Rules To IRS *Financial Adviser*.  
Versprille, A. "Crypto Firms Brace For New Tax-Reporting Rules To IRS" *Financial Adviser*, January 7, 2022. <https://www.fa-mag.com/news/crypto-firms-brace-for-new-tax-reporting-rules-to-irs-65662.html?section=>. Accessed September 19, 2025.
- Wallerstien, E. 2023. Tech Stocks, Meme Stocks, Crypto: Investors Are Feeling Bold Again. *Wall Street Journal*. <https://www.wsj.com/articles/tech-stocks-meme-stocks-crypto-investors-are-feeling-bold-again-f158812b>. Accessed September 19, 2025.
- White House. 2024. Budget of the U.S. Government Fiscal Year 2025. [https://www.whitehouse.gov/wp-content/uploads/2024/03/budget\\_fy2025.pdf](https://www.whitehouse.gov/wp-content/uploads/2024/03/budget_fy2025.pdf). Accessed September 19, 2025.
- White House. 2022. FACT SHEET: President Biden to Sign Executive Order on Ensuring Responsible Development of Digital Assets. <https://bidenwhitehouse.archives.gov/briefing-room/statements-releases/2022/03/09/fact-sheet-president-biden-to-sign-executive-order-on-ensuring-responsible-innovation-in-digital-assets/>. Accessed September 19, 2025.
- YouGov. 2022. Cryptocurrency *YouGov*. [https://docs.cdn.yougov.com/6gpry6x0mi/toplines\\_Cryptocurrency.pdf](https://docs.cdn.yougov.com/6gpry6x0mi/toplines_Cryptocurrency.pdf). Accessed September 19, 2025.

Yousaf, I., L. Pham, and J. W. Goodell. 2023. The Connectedness Between Meme Tokens, Meme Stocks, and Other Asset Classes: Evidence from a Quantile Connectedness Approach. *Journal of International Financial Markets, Institutions and Money* 82: 101694.

## Appendix A. Variable Descriptions

| VARIABLE                             | DESCRIPTION   |
|--------------------------------------|---|
| <i>Variables of Interest</i>         |   |
| <i>Reporting Non-Investor</i>        | 1 if a tax return is neither a <i>Reporting Crypto Seller</i> nor a <i>Reporting Non-Crypto Investor</i> .  |
| <i>Reporting Non-Crypto Investor</i> | 1 if tax return in year <sub>t</sub> reports either a nonzero amount for dividends or a nonzero amount for capital gain on Form 1040 and is not identified as a <i>Reporting Crypto Seller</i> in year <sub>t</sub> .   |
| <i>Reporting Crypto Investor</i>     | Max( <i>Reporting Crypto Seller</i> , <i>Indirect Crypto</i> , <i>Virtual Checkbox</i> , 0)   |
| <i>Reporting Crypto Seller(s)</i>    | 1 if either the description of a Form 8949 transaction is identified as cryptocurrency or a description from Form 1099-B is identified as cryptocurrency for tax return <sub>i</sub> in year <sub>t</sub> .   |
| <i>Reporting Indirect Crypto</i>     | 1 if <i>Indirect Crypto</i> is equal to 1 but <i>Reporting Crypto Seller</i> is equal to 0.   |
| <i>Reporting Virtual Checkbox</i>    | 1 if <i>Virtual Checkbox</i> is equal to 1 but <i>Reporting Crypto Seller</i> and <i>Indirect Crypto</i> are both equal to 0.   |
| <i>Only Form 8949 Crypto</i>         | 1 if the description of a Form 8949 transaction is identified as cryptocurrency and no descriptions from Form 1099-B are identified as cryptocurrency for tax return <sub>i</sub> in year <sub>t</sub> .  |
| <i>Indirect Crypto</i>               | 1 if a taxpayer receives a Form 1099-B with the CUSIP of a cryptocurrency related company in year <sub>t</sub> .  |
| <i>Virtual Checkbox</i>              | 1 if a taxpayer checks the virtual currency question on Schedule 1 (2019) or Form 1040 (2020–2021) yes for year <sub>t</sub> .  |
| <i>IRS Volume</i>                    | The sum of Form 1099-Bs filed for a given security (stock or cryptocurrency) at the month×year level.   |
| <i>CMW Meme Equal Weight</i>         | The number of stocks for which the taxpayer receives at least one Form 1099-B for the year for which the six-digit CUSIP reported on Form 1099-B matches one of the stocks on the Chacon, Morillon, and Wang (2022) list of meme stocks divided by the number of unique six-digit CUSIPs reported on all Form 1099-Bs with valid CUSIPs for the tax year. |
| <i>CMW Meme Volume Weight</i>        | The total sales proceeds reported on Forms 1099-Bs for the year for which the six-digit CUSIP reported on Form 1099-B matches one of the stocks on the Chacon, Morillon, and Wang (2022) list of meme stocks divided by the total sales proceeds reported on all Form 1099-Bs with valid CUSIPs for the tax year.   |
| <i>HJZZ Meme Equal Weight</i>        | The number of stocks for which the taxpayer receives at least one Form 1099-B for the year for which the six-digit CUSIP reported on Form 1099-B matches one of the stocks on the Hu, Jones, Zhang and Zhang (2023) list of meme stocks divided by the number of unique six-digit CUSIPs reported on all Form 1099-Bs with valid CUSIPs for the tax year. |
| <i>HJZZ Meme Volume Weight</i>       | The total sales proceeds reported on Forms 1099-Bs for the year for which the six-digit CUSIP reported on Form 1099-B matches one of the stocks on the Hu, Jones, Zhang and Zhang (2023) list of meme stocks divided by the total sales proceeds reported on all Form 1099-Bs with valid CUSIPs for the tax year.   |
| <i>Continuous/Discrete Variables</i> |   |
| <i>Age</i>                           | The year in which tax return <sub>it</sub> was filed less the birth year for the primary taxpayer on tax return <sub>i</sub> .  |
| <i>Wages</i>                         | Wages as reported on Form 1040 for tax return <sub>i</sub> in year <sub>t</sub> .   |
| <i>Interest</i>                      | Taxable interest as reported on Form 1040 for tax return <sub>i</sub> in year <sub>t</sub> . For regression analysis, we take the natural log of one plus the variable.   |
| <i>Dividends</i>                     | Taxable dividends as reported on Form 1040 for tax return <sub>i</sub> in year <sub>t</sub> . For regression analysis, we take the natural log of one plus the variable.  |
| <i>Capital Gain†</i>                 | Capital gain/loss as reported in Form 1040 for tax return <sub>i</sub> in year <sub>t</sub> . For regression analysis, we take the natural log of one plus the variable.  |

|                             |   |
|-----------------------------|---|
| <i>Taxable Income</i>       | Taxable income after all deductions reported on Form 1040 for tax return <sub>i</sub> in year <sub>t</sub> .  |
| <i>Average Ret</i>          | Average daily return for a security for each month.   |
| <i>Std Dev of Returns</i>   | Standard deviation of daily returns at the security-month-year level.   |
| <i>Volume</i>               | Natural Log of one plus the sum of the sales proceeds reported for taxpayer <sub>i</sub> in year <sub>t</sub> on all forms 1099-B with valid CUSIPs.        |
| <i>Number Unique Stocks</i> | Natural Log of one plus the count of unique six-digit CUSIPs reported for taxpayer <sub>i</sub> in year <sub>t</sub> on all forms 1099-B with valid CUSIPs. |
| <i>Number Trades</i>        | Natural Log one plus of the sum of the number Form 1099-Bs with valid CUSIPs received by taxpayer <sub>i</sub> in year <sub>t</sub> .                       |

*Indicator Variables*

|                               |   |
|-------------------------------|---|
| <i>Married</i>                | 1 if tax return <sub>i</sub> in year <sub>t</sub> reports both a primary taxpayer and a spouse.   |
| <i>Single Male</i>            | 1 if tax return <sub>i</sub> in year <sub>t</sub> does not report a spouse and census data lists the primary taxpayer as male. Zero if census data lists the primary taxpayer as female. Missing otherwise. |
| <i>Sch A</i> <sup>‡</sup>     | 1 if tax return <sub>i</sub> in year <sub>t</sub> had Schedule A for itemized deductions attached.  |
| <i>EIC</i> <sup>‡</sup>       | 1 if tax return <sub>i</sub> in year <sub>t</sub> included Schedule EIC for the Earned Income Tax Credit.   |
| <i>Homeowner</i> <sup>‡</sup> | 1 if tax return <sub>i</sub> in year <sub>t</sub> includes a Form 1098 for mortgage interest.   |
| <i>Gambler</i> <sup>‡</sup>   | 1 if tax return <sub>i</sub> in year <sub>t</sub> includes a W-2G for gambling winnings with reported amounts in Box 1 or Box 7.  |
| <i>Student</i> <sup>‡</sup>   | 1 if tax return <sub>i</sub> in year <sub>t</sub> includes a 1098-T for tuition and has reported amounts in Box 1 for tuition and fees in Box 1.  |
| <i>Paid Preparer</i>          | 1 if tax return <sub>i</sub> in year <sub>t</sub> reports a paid preparer PTIN on Form 1040 for tax return <sub>i</sub> in year <sub>t</sub> .  |
| <i>Self Prepared</i>          | 1 if tax return <sub>i</sub> in year <sub>t</sub> does not report a paid preparer PTIN on Form 1040 for tax return <sub>i</sub> in year <sub>t</sub> .  |

<sup>†</sup> *Capital Gain* is reported on Form 1040 after the capital loss limitation. The minimum value for this variable is -3,000. Losses in excess of -3,000 are carried forward and included in the next year's capital gain amount.

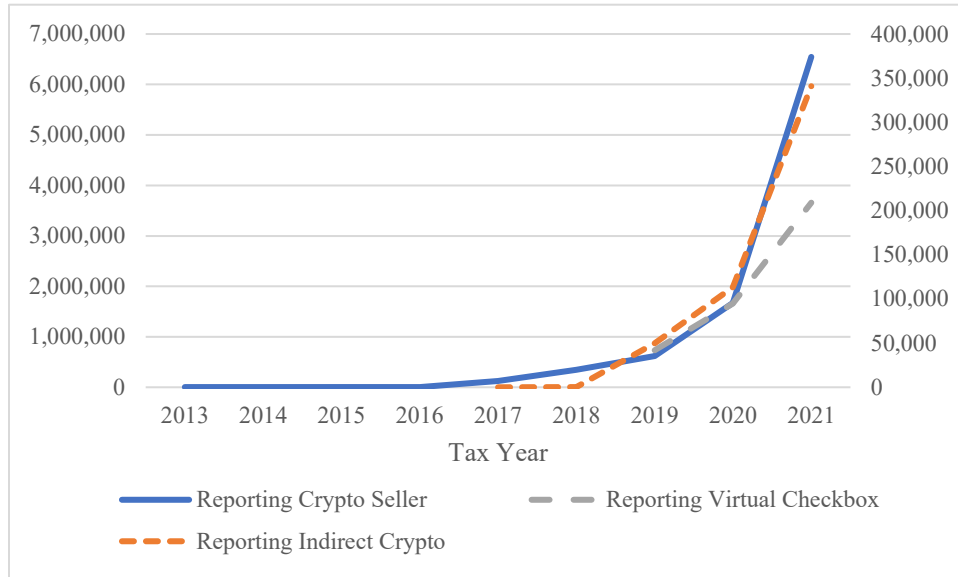
<sup>‡</sup> The indicator variables *Sch A* and *EIC* indicate the presence of their respective forms, Schedule A and Schedule EIC. Filing these forms is at the discretion of the taxpayer and does not mean that they claimed the credit or reduced the taxes due of the taxpayer. *Homeowner* is an indicator variable for the presence of third-party reported information on mortgage interest. It therefore captures taxpayers who may or may not report the item on their individual tax returns, but it may not capture taxpayers who fall under the reporting thresholds, such as taxpayers who pay less than \$600 in mortgage interest. For indicator variables that use third-party reported data (*Homeowner*, *Gambler*, and *Student*), we code the variable as 1 if either the primary taxpayer or spouse received the form.

## Appendix B: Indirect Cryptocurrency Securities

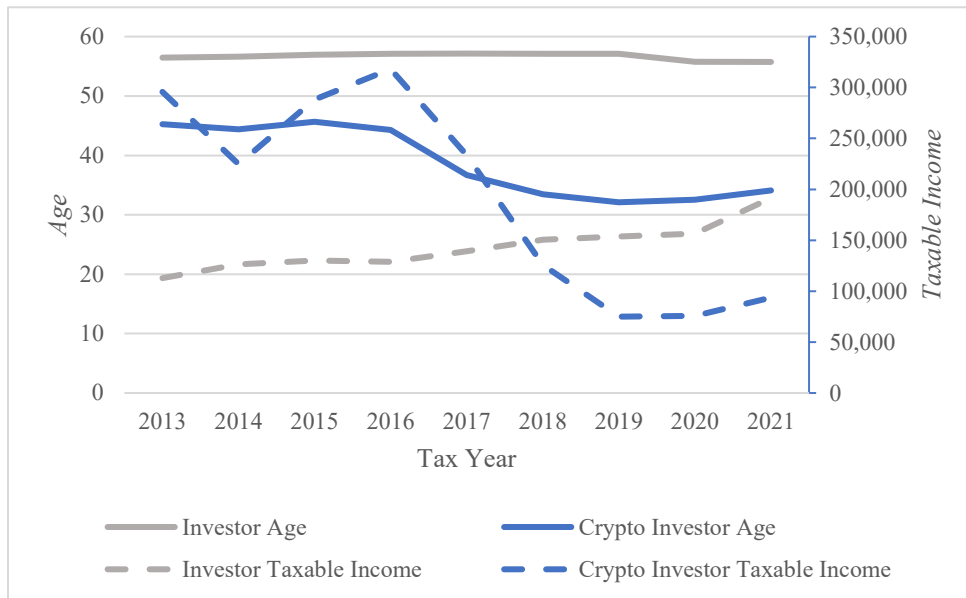
| <b>Cryptocurrency Fund</b>              | <b>Ticker</b> |
|---|---------------|
| Bitwise 10 Crypto Index Fund            | BITW          |
| Grayscale Bitcoin Trust                 | GBTC          |
| The Bitcoin Fund                        | QBTC          |
| Grayscale Ethereum Trust                | ETHE          |
| Grayscale Bitcoin Cash Trust            | BCHG          |
| Grayscale Ethereum Classic Trust        | ETCG          |
| Grayscale Litecoin Trust                | LTCN          |
| Vaneck SolidX Bitcoin Trust             | XBTC          |
| Grayscale Digital Large Cap Fund        | GDLC          |
| Bitcoin Tracker One                     | COINXBT       |
| Amun Crypto Basket Index ETP            | HODL          |
| CI Galaxy Bitcoin Funds                 | BTCG          |
| The Ether Fund                          | QETH          |
| Grayscale Stellar Lumens Trust          | GXLM          |
| Grayscale Horizon Trust                 | HZEN          |
| Grayscale Zcash Trust                   | ZCSH          |
| Ninepoint Bitcoin ETF                   | BITC.TO       |
| Osprey Bitcoin Trust                    | OBTC          |
| Bitcoin Strategy ProFund                | BTCFX         |
| Proshares Bitcoin Strategy ETF          | BITO          |
| Purpose Bitcoin ETF                     | BTCC          |
| Purpose Ether ETF                       | ETHH          |
| Purpose Crypto Opportunities ETF        | CRYP.TO       |
| 3iQ Bitcoin ETF                         | BTCQ          |
| 3iQ Ether Staking ETF                   | ETHQ          |
| Valkyrie Bitcoin and Ether Strategy ETF | BTF           |
| Vaneck Bitcoin Strategy ETF             | XBTF          |
| Amun Ripple XRP ETP                     | AXRP          |
| Fidelity Advantage Bitcoin ETF          | FBTC          |

**Figure 1: Trends in Cryptocurrency Reporting over Time**

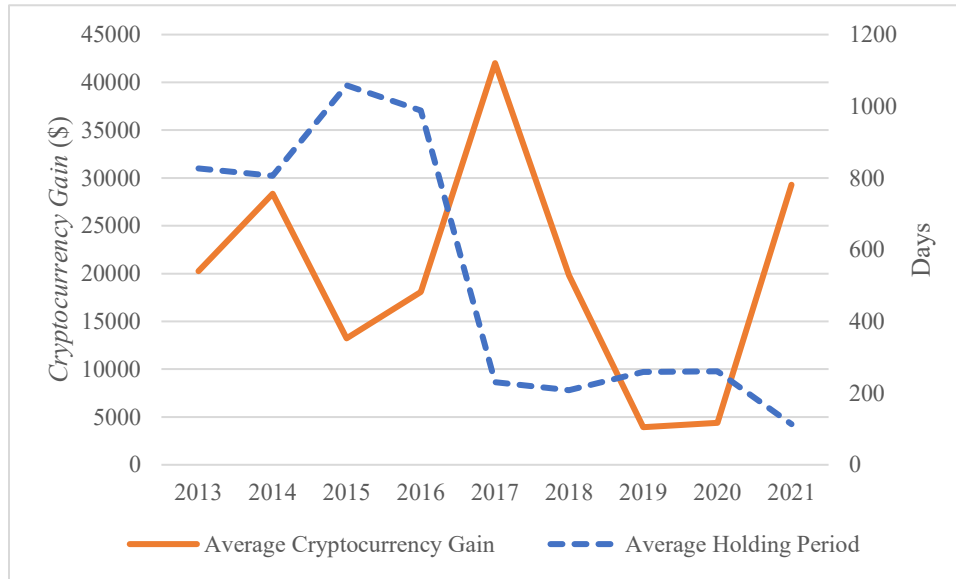
**Panel A: Number of Reporters over Time**



**Panel B: Reporting Cryptocurrency Seller Age and Income over Time**

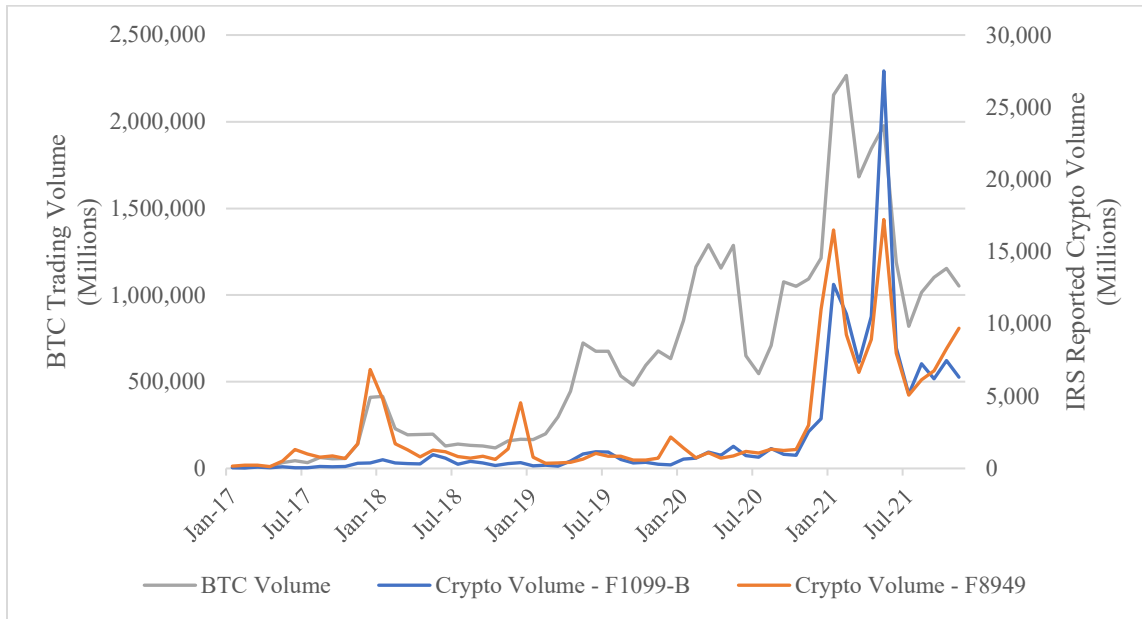


**Panel C: Average Gain and Holding Period of Reported Cryptocurrency Activity**



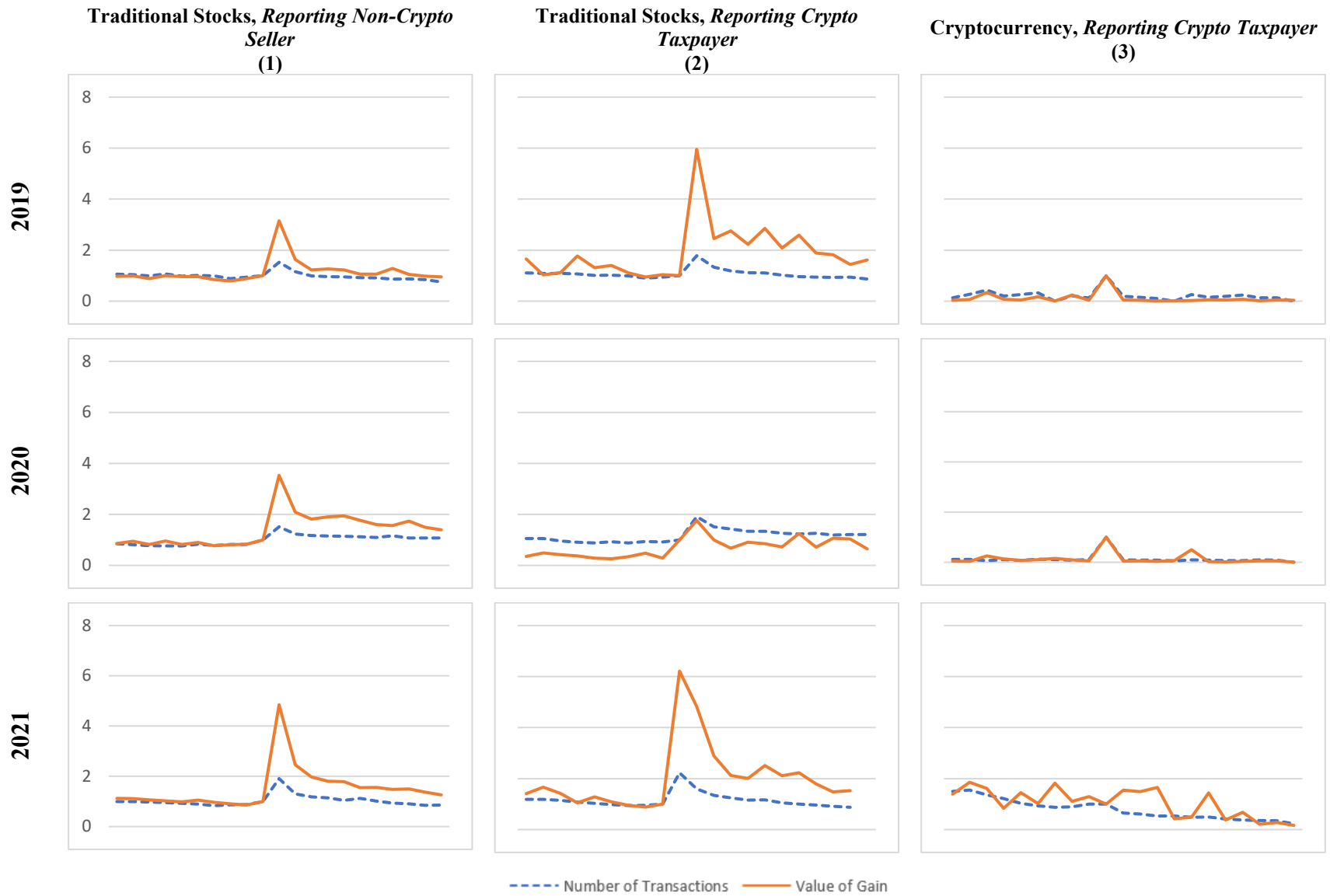
**Note:** Figure 1 Panel A presents the number of tax returns filed that report cryptocurrency in at least one way. *Reporting Crypto Sellers* are taxpayers that report direct sales of cryptocurrency on either Form 8949 or have cryptocurrency reported by third parties on Form 1099-B. *Reporting Indirect Crypto* are taxpayers who report sales of traditional securities that primarily invest in cryptocurrencies. *Indirect Crypto* uses the right-hand axis and does not include any *Reporting Crypto Sellers*. *Reporting Virtual Checkbox* is the number of taxpayers who mark the virtual currency checkbox as yes. This variable is only available starting in 2019 and does not include any *Reporting Crypto Sellers* or *Reporting Indirect Crypto* taxpayers. Figure 1 Panel B splits the population into *Reporting Crypto Seller* or *Reporting Non-Crypto Investor* and shows both the age (left-hand Y axis) and *Taxable Income* (right-hand Y axis) for both groups over the sample period. Figure 1 Panel C shows the average holding period for cryptocurrency sales on Form 8949 (right-hand axis) along with the average total gain of cryptocurrency sales on Form 8949 (left-hand axis). Statistics from Form 8949 are chosen, as it allows us to show complete statistics for the full sample period compared to Form 1099-B, which was rarely filed for cryptocurrency prior to 2017.

**Figure 2: IRS Reported Volume Compared to Bitcoin Blockchain Volume**



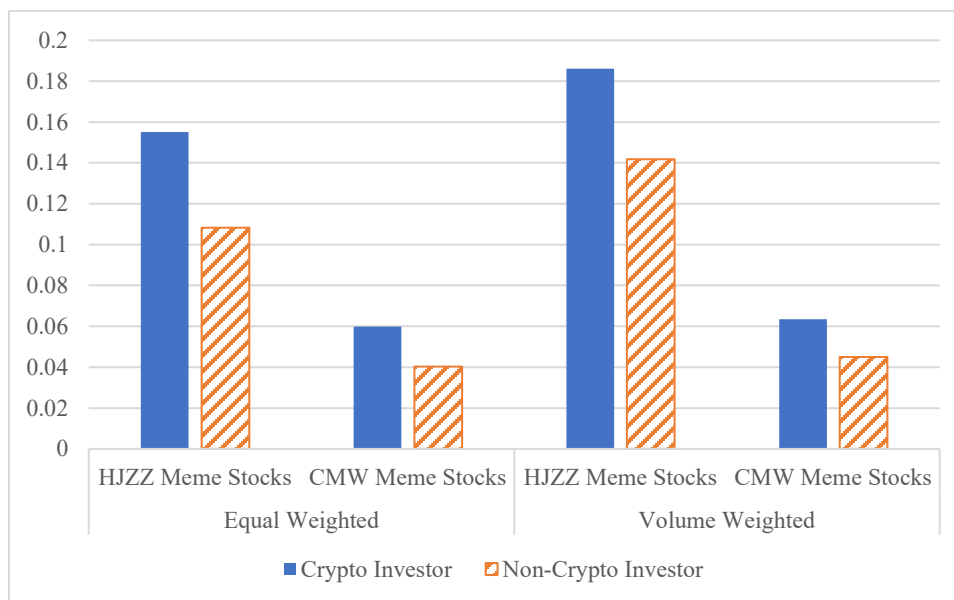
**Note:** Figure 2 reports three measures of cryptocurrency volume. First, BTC Volume is the daily volume of Bitcoin transactions as recorded on the blockchain on a monthly basis. Crypto Volume – 1099-B is the total monthly sales price reported to the IRS on Form 1099-B identified as cryptocurrency transactions. Crypto Volume – F8949 is the total monthly sales price reported to the IRS on Form 8949 and identified as cryptocurrency.

**Figure 3: Tax Sensitivity of Cryptocurrency and Stock Sales**



**Note:** Figure 3 shows the total cryptocurrency/stock gains (solid orange line) and the sum of the number of cryptocurrency/stock transactions (dashed blue line) with holding periods between 42 and 62 weeks, as reported to the IRS on Form 1099-B. We report stock and cryptocurrency sales for the most recent three years of our sample period. We omit including graphs prior to 2019 due to there not being enough cryptocurrency sales to have meaningful graphs. We scale each graph by the Week 51 amount and standardize the y-axis between 0 and 8 for all groups to enhance comparability between subsamples. Column (1) shows data for traditional stocks for investors who are not *Reporting Crypto Sellers*. Column (2) shows the data for traditional stocks for *Reporting Crypto Sellers*. Finally, Column (3) shows data for cryptocurrency sales for *Reporting Crypto Sellers*. All graphs use data from Form 1099-B, as it typically reports both the buy and sell date by transaction.

**Figure 4: Meme Stock Holding by *Reporting Crypto Sellers***



**Note:** Figure 4 shows the average of meme stocks that taxpayers sell in 2021 as a percentage of all equity sales. HJZZ Meme stocks are meme stocks identified by Hu, Jones, Zhang, and Zhang (2023), which includes stocks that were restricted by Robinhood in 2021. CMW Meme stocks are stocks identified by Chacon, Morillon, and Wang (2022) through textual analysis of the Reddit forum Wallstreetbets. For equal-weighted portfolios, the amount is the number of unique meme stocks for which a taxpayer receives Form 1099-B divided by the total unique stocks for which the taxpayer receives a Form 1099-B during 2021. For volume-weighted portfolios, the amount is the total sales proceeds from meme stocks for which a taxpayer receives Form 1099-B divided by the total sales proceeds for all stocks for which the taxpayer receives a Form 1099-B. Stocks must have a valid CUSIP number reported on the Form 1099-B, and unique stocks are identified using six-digit CUSIPs.

**Table 1. Panel A. Descriptive Statistics**

| <i>Continuous Variables</i>       | <i>Reporting Non-Investor<br/>(n=1,077,122,976)</i> |           |        | <i>Reporting Non-Crypto Investor<br/>(n=294,069,372)</i> |           |        | <i>Reporting Crypto Investor<br/>(n=17,976,537)</i> |           |        |
|-----------------------------------|---|-----------|--------|--|-----------|--------|---|-----------|--------|
|                                   | Mean  | Std. Dev. | Median | Mean   | Std. Dev. | Median | Mean  | Std. Dev. | Median |
| <i>Age</i>                        | 42  | 17        | 40     | 57   | 19        | 58     | 36  | 13        | 31     |
| <i>Wages</i>                      | 38,891  | 2,515,923 | 25783  | 85,420   | 456,270   | 34,820 | 84,174  | 3,166,283 | 47,972 |
| <i>Interest</i>                   | 106   | 58,469    | 0      | 3,385  | 5,754,693 | 45     | 1,000   | 532,417   | 0      |
| <i>Dividends</i>                  |   |           |        | 8,727  | 1,244,489 | 477    | 2,059   | 211,118   | 0      |
| <i>Capital Gain</i>               |   |           |        | 26,429   | 1,059,385 | 35     | 21,576  | 1,279,850 | 0      |
| <i>Taxable Income</i>             | 34,022  | 116,357   | 19,104 | 143,494  | 1,295,327 | 66,697 | 104,770   | 1,376,587 | 38,197 |
| <b><i>Indicator Variables</i></b> |   |           |        |  |           |        |   |           |        |
| <i>Sch A</i>                      | 0.1583  | 0.3650    | 0      | 0.4126   | 0.4923    | 0      | 0.1200  | 0.3250    | 0      |
| <i>Married</i>                    | 0.3131  | 0.4637    | 0      | 0.5773   | 0.4940    | 0      | 0.3878  | 0.4872    | 0      |
| <i>Single Male</i>                | 0.3191  | 0.4661    | 0      | 0.1861   | 0.3892    | 0      | 0.4711  | 0.4992    | 0      |
| <i>Student</i>                    | 0.0643  | 0.2452    | 0      | 0.0329   | 0.1784    | 0      | 0.1660  | 0.3721    | 0      |
| <i>Indirect Crypto</i>            |   |           |        |  |           |        | 0.0410  | 0.1983    | 0      |
| <i>EIC</i>                        | 0.1590  | 0.3657    | 0      | 0.0150   | 0.1215    | 0      | 0.0705  | 0.2560    | 0      |
| <i>Gambler</i>                    | 0.0152  | 0.1224    | 0      | 0.0163   | 0.1265    | 0      | 0.0172  | 0.1301    | 0      |
| <i>Paid Preparer</i>              | 0.5126  | 0.4998    | 1      | 0.6834   | 0.4651    | 1      | 0.4164  | 0.4930    | 0      |

**Panel B. Descriptive Statistics by Cryptocurrency Type**

| <i>Continuous Variables</i>       | <i>Reporting Crypto Seller</i><br>(n=9,329,583) |           |        | <i>Reporting Indirect Crypto</i><br>(n=503,954) |           |         | <i>Reporting Virtual Checkbox</i><br>(n=6,043,631) |           |        |
|-----------------------------------|---|-----------|--------|---|-----------|---------|--|-----------|--------|
|                                   | Mean  | Std. Dev. | Median | Mean  | Std. Dev. | Median  | Mean   | Std. Dev. | Median |
| <i>Age</i>                        | 34  | 11        | 31     | 52  | 17        | 52      | 37   | 14        | 33     |
| <i>Wages</i>                      | 78,321  | 482,064   | 47,972 | 146,798   | 1,214,104 | 62,847  | 87,985   | 5,083,282 | 50,007 |
| <i>Interest</i>                   | 868   | 689,728   | 0      | 5,710   | 251,410   | 26      | 811  | 72,945    | 0      |
| <i>Dividends</i>                  | 1,341   | 224,199   | 0      | 14,948  | 217,867   | 467     | 2,092  | 188,503   | 0      |
| <i>Capital Gain</i>               | 18,409  | 1,179,836 | 0      | 117,778   | 2,296,782 | 449     | 18,447   | 1,309,048 | 0      |
| <i>Taxable Income</i>             | 92,796  | 1,227,761 | 38,197 | 330,111   | 2,560,502 | 103,261 | 104,464  | 1,449,134 | 42,375 |
| <b><i>Indicator Variables</i></b> |   |           |        |   |           |         |  |           |        |
| <i>Sch A</i>                      | 0.1121  | 0.3155    | 0      | 0.2790  | 0.4485    | 0       | 0.1190   | 0.3238    | 0      |
| <i>Married</i>                    | 0.3870  | 0.4871    | 0      | 0.5844  | 0.4928    | 1       | 0.3726   | 0.4835    | 0      |
| <i>Single Male</i>                | 0.4997  | 0.5000    | 0      | 0.2937  | 0.4555    | 0       | 0.4418   | 0.4966    | 0      |
| <i>Student</i>                    | 0.1817  | 0.3856    | 0      | 0.0613  | 0.2399    | 0       | 0.1504   | 0.3574    | 0      |
| <i>Indirect Crypto</i>            | 0.1388  | 0.3457    | 0      | 1.0000  |           | 1       |  |           |        |
| <i>EIC</i>                        | 0.0773  | 0.2671    | 0      | 0.0205  | 0.1416    | 0       | 0.0642   | 0.2452    | 0      |
| <i>Gambler</i>                    | 0.0193  | 0.1376    | 0      | 0.0209  | 0.1430    | 0       | 0.0137   | 0.1163    | 0      |
| <i>Paid Preparer</i>              | 0.4511  | 0.4976    | 0      | 0.6325  | 0.4821    | 1       | 0.3448   | 0.4753    | 0      |

**Notes.** Table 1 Panel A reports descriptive statistics for the full sample of taxpayers (2013–2021) split out between *Reporting Non-Investors*, *Reporting Non-Crypto Investors*, and *Reporting Crypto Investors*. *Reporting Crypto Investors* are taxpayer-years that we identify as selling cryptocurrency for year t through textual analysis of Form 8949 Capital Gain descriptions, that receive a Form 1099-B that we identify as relating to cryptocurrency through textual analysis of the description, that we identify as holding an indirect cryptocurrency stock on Form 1099-B, or that answered “yes” to the virtual currency checkbox question. *Reporting Non-Crypto Investors* are taxpayers who are not identified as selling cryptocurrency but report nonzero levels of either *Dividends* or a *Capital Gain* on their Form 1040. *Reporting Non-Investors* are all other taxpayers. *Capital Gain* has a lower bound equal to the 3,000 capital loss limitation. *Single Male* and *Married* are part of a categorical variable, where the baseline is taxpayers who do not file a joint return and are female. Due to missing values for gender and age in the Social Security Administration database, a few values for those amounts are missing. Table 1 Panel B reports descriptive statistics for three non-overlapping groups of *Reporting Crypto Investors*. *Reporting Crypto Seller(s)* are taxpayer-years that we identify as selling cryptocurrency through textual analysis of Form 8949 Capital Gain descriptions or that receive a Form 1099-B that we identify as relating to cryptocurrency through textual analysis of the description. *Reporting Indirect Crypto* are taxpayer-years that we identify as holding an indirect cryptocurrency stock on Form 1099-B but are not *Reporting Crypto Seller(s)*. *Reporting Virtual Checkbox* are taxpayers who answered “yes” to the virtual currency checkbox question but are not *Reporting Crypto Seller(s)* nor *Reporting Indirect Crypto* taxpayers. These three groups are non-overlapping. To comply with IRS data disclosure requirements, medians are calculated as a local average around the true median.

**Table 2: Comparison Between Surveys, Academic, and Coinbase Estimates versus IRS**

**Panel A. Overall Reporting of Cryptocurrency: Current and Previous Ownership**

|  | (1)  | (2)  | (3)   | (4)  |
|--|--|--|---|--|
|  | Reported Percentage of Cryptocurrency Owners | Percentage of Cryptocurrency Owners (IRS) <sup>f</sup> | Number of Cryptocurrency owners (Estimated, millions) | Number of Cryptocurrency Owners (IRS, millions) <sup>f</sup> |
| Federal Reserve - Economic Wellbeing of U.S. Households in 2021 <sup>a</sup> | 12%  |  | 31  |  |
| Pew Research Center - American Trends Panel Survey <sup>b</sup>              | 16%  |  | 41.3  |  |
| YouGov - Cryptocurrency <sup>c</sup>   | 21%  | 6.5%   | 54.3  | 17.4   |
| Aiello et al. 2024 <sup>d</sup>  | 16%  |  | 41.3  |  |
| Coinbase, Inc. (2021) U.S. Users (Estimated) <sup>e</sup>                    |  |  | 42.7  |  |

**Panel B. Percentage of People in 2021 who Report Cryptocurrency Ownership within Given Income Levels**

|                               | Federal Reserve (Household Income)<br>(1) | IRS Reporting (Taxable Income)<br>(2) |
|-------------------------------|---|---------------------------------------|
| Less than \$25,000            | 10%                                       | 5.0%                                  |
| Between \$25,000 and \$49,999 | 10%                                       | 7.0%                                  |
| Between \$50,000 and \$99,999 | 11%                                       | 7.9%                                  |
| \$100,000 or more             | 16%                                       | 9.9%                                  |

<sup>a</sup> Federal Reserve Economic Well-Being of U.S. Households in 2021 conducted a survey of 11,874 U.S. adults. The percentage is the number of respondents who answered yes to at least one of the following responses to the question “In the past year, have you done the following with cryptocurrency, such as Bitcoin or Ethereum?”: (1) bought or held as an investment; (2) used to buy something or make a payment; (3) used to send money to friends or family.

<sup>b</sup> Pew Research Center American Trends Panel Survey, Wave 95, conducted of 10,371 U.S. adults in 2019. Question asked: “Have you yourself ever invested in, traded, or used a cryptocurrency such as Bitcoin or Ether?”; response: “Yes, I have done this.”

<sup>c</sup> YouGov Cryptocurrency conducted a survey of 998 U.S. Adult Citizens in July 2022. To the question, “Have you ever owned cryptocurrency,” 11.92 percent responded “Yes, I currently own it” and 8.62 percent responded “Yes, but I no longer own it.”

<sup>d</sup> Aiello et al. (2024) use a proprietary set of financial transactions to examine cryptocurrency investors. An investor in their data is an individual who deposits money into a

centralized cryptocurrency exchange between 2015 and 2023. They find that 16 percent of individuals in their dataset make a deposit at least once over their sample period. To estimate a U.S.-wide population, this percentage (16 percent) is then multiplied by the adult U.S. population.

<sup>e</sup> U.S. Cryptocurrency users calculated using Coinbase financial reporting is calculated using Coinbase's reporting of its monthly transacting users (MTUs) as reported in Coinbase Forms 10-K and 10-Q. To calculate an upper bound, we assume that there is no overlap between the four quarters of 2021 (33.7 million MTUs). Next, we adjust the number of MTUs to account for non-U.S. Coinbase users (19.1 percent) and for Coinbase's overall market share (63.8 percent) to estimate the total U.S. Population of cryptocurrency users ( $33.7 \times (1 - 0.191) = 0.638$ ). We detail these calculations in Online Appendix D.

<sup>f</sup> To most accurately match the external estimates of cryptocurrency users to IRS data, we begin our estimate with our sample of *Reporting Crypto Investors*. As the surveys and other data sources measure cryptocurrency at the individual level, not the household level, we adjust our total number of cryptocurrency owners to account for the fact that tax returns with a filing status of married filing jointly are two separate owners rather than one. In Column (2), the denominator for the percentage of cryptocurrency owners is the total number of taxpayers in our sample (after adjusting for *Married* tax returns as above). In Panel B, we limit our identification of cryptocurrency owners using only 2021 data, which conforms with the Federal Reserve question, which asks only about cryptocurrency usage in the prior 12 months. We detail these calculations more in Online Appendix D.

**Note:** In Table 2 Panel A, we report the several measures of cryptocurrency ownership that do not rely on IRS administrative data compared to our results using administrative data. In column (1), we report the percentage of U.S. adults reporting cryptocurrency ownership for the three surveys, one academic paper, and one public company. For Aiello et al. (2024), we report the percentage of their sample that deposited money into a cryptocurrency exchange. For Coinbase, we estimate cryptocurrency users using reported active users reported in Coinbase's Form 10-Q and 10-Ks. In Column (2), we report the percentage of individuals who we identify as having engagement with cryptocurrency over the total number of individuals in our sample. See Online Appendix D for more details on this calculation. In Column (3), we report the estimated number of U.S. adults who are cryptocurrency owners. For all three surveys and for the Aiello et al. (2024) estimates, the estimated number of US adults is calculated by taking the U.S. population from the 2020 Census (331.5 million) and adjusting it for the percentage of the population under 18 years of age (21.7 percent). We then multiply this number by the percentage of respondents for each source that owned cryptocurrency. For Coinbase, this is a direct calculation. In column (4), we report the number of individuals identified as owning cryptocurrency as calculated in Online Appendix D. In Panel B, we report the percentage of individuals who own cryptocurrency broken out by either household income (Federal Reserve) or taxable income (IRS data). We calculate the IRS percentage as detailed in Online Appendix D.

**Table 3: Virtual Currency Checkbox**

| Dependent Variable: <i>Only Form 8949 Crypto</i> |                      |    |
|--|----------------------|----|
| Independent Variables                            | (1)                  |    |
| <i>Post</i>                                      | 0.0023<br>(0.00004)  | 10 |
| <i>Self Prepared</i>                             | 0.0000<br>(0.00001)  | 3  |
| <b><i>Post×Self Prepared</i></b>                 | 0.0002<br>(0.00006)  | 7  |
| <i>Age Under 24</i>                              | 0.0019<br>(0.00004)  | 10 |
| <i>Age 25–44</i>                                 | 0.0029<br>(0.00004)  | 10 |
| <i>Age 45–64</i>                                 | 0.0012<br>(0.00003)  | 10 |
| <i>Married</i>                                   | 0.0009<br>(0.00003)  | 10 |
| <i>Single Male</i>                               | 0.0012<br>(0.00003)  | 10 |
| <i>Ln(Dividends)</i>                             | 0.0003<br>(0.00001)  | 10 |
| <i>Ln(Interest)</i>                              | 0.0001<br>(0.00001)  | 10 |
| <i>Indirect Crypto</i>                           | 0.0670<br>(0.00375)  | 10 |
| <i>EIC</i>                                       | -0.0008<br>(0.00002) | 10 |
| <i>Sch A</i>                                     | -0.0002<br>(0.00003) | 10 |
| <i>Homeowner</i>                                 | 0.0006<br>(0.00003)  | 10 |
| <i>Student</i>                                   | 0.0005<br>(0.00007)  | 10 |
| <i>Gambler</i>                                   | 0.0004<br>(0.00009)  | 10 |
| Observations per Random Sample                   | 10,000,000           |    |
| Average Adjusted R-Squared                       | 0.047                |    |

**Note:** Table 3 presents the regression coefficients from the OLS model from equation (1). *Only Form 8949 Crypto* is a variable that takes the value of 1 if the description of a Form 8949 transaction is identified as cryptocurrency and no descriptions from Form 1099-B are identified as cryptocurrency for tax return and zero otherwise. *Self Prepared* is a variable that takes the value of one if the tax return does not report a preparer PTIN. *Post* is a variable equal to one for the years after 2019. All other variables are defined in Appendix A. For each column, a random sample of 10 million observations is taken from the population to estimate the coefficients. This procedure is done 10 times and averaged regression coefficients, standard errors, and adjusted R-squared are shown. Significance is then determined as the number of times the value was significant at the 5 percent level, with 10 meaning the coefficient was significant in all 10 random draws.

**Table 4: Probability of Becoming a *Reporting Crypto Seller***

| Dependent Variable: <i>Reporting Crypto Seller</i> |                         |
|--|-------------------------|
| Independent Variables                              | (1)                     |
| <i>Ln(Dividends)</i>                               | 0.0444***<br>(0.00001)  |
| <i>Ln(Interest)</i>                                | -0.008***<br>(0.00001)  |
| <i>Indirect Crypto</i>                             | -15.118***<br>(0.37924) |
| <i>EIC</i>   | -0.0788***<br>(0.00005) |
| <i>Sch A</i>                                       | 0.0901***<br>(0.00004)  |
| <i>Homeowner</i>                                   | 0.023***<br>(0.00003)   |
| <i>Paid Preparer</i>                               | -0.0946***<br>(0.00002) |
| <i>Student</i>                                     | 0.1272***<br>(0.00005)  |
| <i>Gambler</i>                                     | 0.2917***<br>(0.00012)  |
| Observations                                       | 65,893,465              |
| Year Fixed Effects                                 | Yes                     |
| Pseudo R-Squared                                   | 0.167                   |

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

**Note:** Table 4 shows the coefficients for the logistic regression results of equation (2). Standard errors for the coefficients are in parentheses. The dependent variable, *Reporting Crypto Seller*, is equal to one if a taxpayer is identified as selling cryptocurrency on Form 8949 or 1099-B. Other variables are defined in Appendix A. The model uses a matched sample hazard model. Each taxpayer must have tax return data for the full sample period. Taxpayers are then matched based on 2013 data using state of residence, age, filing status (married filing jointly, single male, single female), and percentile rank of *Wages*. We then keep all observations prior to a taxpayer becoming a *Reporting Crypto Seller* and the first observation in which a taxpayer is a *Reporting Crypto Seller*.

**Table 5: IRS Reporting Volume**

| Dependent Variable:                                 | <i>IRS Volume</i>             |                               |                               |
|---|-------------------------------|-------------------------------|-------------------------------|
| Independent Variables                               | (1)                           | (2)                           | (3)                           |
| <i>Average Return</i>                               | 10.478***<br>(0.2892)         | 15.7432***<br>(0.2266)        | 24.2082***<br>(0.2523)        |
| <i>Std Dev of Returns</i>                           | -19.3949***<br>(0.0689)       | -9.3014***<br>(0.0544)        | -13.1396***<br>(0.0716)       |
| <i>Negative Return</i>                              | 0.0165***<br>(0.0049)         | -0.0446***<br>(0.0036)        | -0.0127***<br>(0.0038)        |
| <b><i>Cryptocurrency Ind</i></b>                    | <b>2.4884***<br/>(0.1977)</b> | <b>-0.2128<br/>(0.3743)</b>   | <b>-0.2676<br/>(0.3666)</b>   |
| <b><i>Cryptocurrency Ind×Average Return</i></b>     | <b>-13.5983<br/>(17.1886)</b> | <b>-19.7033<br/>(20.4801)</b> | <b>-24.3603<br/>(20.2152)</b> |
| <b><i>Cryptocurrency Ind×Std Dev of Returns</i></b> | <b>9.1556*<br/>(5.4723)</b>   | <b>-2.5311<br/>(8.5844)</b>   | <b>-0.1162<br/>(8.1384)</b>   |
| <i>Meme Stock Ind</i>                               | 5.5588***<br>(0.1122)         | 1.2689***<br>(0.0782)         | 1.2452***<br>(0.0799)         |
| <i>Meme Stock Ind×Average Return</i>                | -17.5303***<br>(5.1886)       | -21.6368***<br>(2.7618)       | -29.4172***<br>(2.9821)       |
| <i>Meme Stock Ind×Std Dev of Returns</i>            | 25.2722***<br>(1.5711)        | 14.0672***<br>(1.1059)        | 15.9761***<br>(1.1476)        |
| Observations  | 2,185,108                     | 2,185,108                     | 2,185,108                     |
| Fixed Effect  | None                          | Year                          | Month×Year                    |
| Adjusted R-Squared                                  | 0.035                         | 0.457                         | 0.457                         |

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

**Note:** Table 5 shows the coefficients for the results of the following equation:

$$IRS\ Volume = \alpha + \beta_1 Average\ Return + \beta_2 Std\ Dev\ of\ Returns + \beta_3 Negative\ Return + \beta_4 Cryptocurrency\ Ind + \beta_5 Cryptocurrency\ Ind \times Average\ Return + \beta_6 Cryptocurrency\ Ind \times Std\ Dev\ of\ Returns + \beta_7 Meme\ Stock\ Ind + \beta_8 Meme\ Stock\ Ind \times Average\ Return + \beta_9 Meme\ Stock\ Ind \times Std\ Dev\ of\ Returns + \varepsilon.$$

Observations are at the security×month×year. Standard errors for the coefficients are in parentheses. The dependent variable, *IRS Volume*, is equal to the sum of Form 1099-Bs filed for a given security (stock or cryptocurrency) at the month×year level. Other variables are defined in appendix A.

**Table 6: Meme Stock Holding**

| Dependent Variable:                   | <i>CMW Meme Volume Weight</i> |    | <i>CMW Meme Equal Weight</i> |    | <i>HJZZ Meme Volume Weight</i> |    | <i>HJZZ Meme Equal Weight</i> |    |
|---------------------------------------|-------------------------------|----|------------------------------|----|--------------------------------|----|-------------------------------|----|
| Independent Variables                 | (1)                           |    | (2)                          |    | (3)                            |    | (4)                           |    |
| <b><i>Reporting Crypto Seller</i></b> | 0.0425                        | 10 | 0.0249                       | 10 | 0.0579                         | 10 | 0.0418                        | 10 |
|                                       | (0.00022)                     |    | (0.00017)                    |    | (0.00025)                      |    | (0.00019)                     |    |
| <i>Indirect Crypto</i>                | -0.0064                       | 10 | -0.0048                      | 10 | 0.0025                         | 10 | 0.0039                        | 10 |
|                                       | (0.00029)                     |    | (0.00018)                    |    | (0.00035)                      |    | (0.00023)                     |    |
| <i>Age Under 24</i>                   | 0.0569                        | 10 | 0.0509                       | 10 | 0.0682                         | 10 | 0.0632                        | 10 |
|                                       | (0.00035)                     |    | (0.00028)                    |    | (0.00038)                      |    | (0.00031)                     |    |
| <i>Age 25-44</i>                      | 0.0482                        | 10 | 0.0431                       | 10 | 0.0593                         | 10 | 0.055                         | 10 |
|                                       | (0.00015)                     |    | (0.00012)                    |    | (0.00017)                      |    | (0.00014)                     |    |
| <i>Age 45-64</i>                      | 0.0034                        | 10 | 0.0037                       | 10 | 0.0071                         | 10 | 0.0073                        | 10 |
|                                       | (0.00009)                     |    | (0.00007)                    |    | (0.00011)                      |    | (0.00009)                     |    |
| <i>Married</i>                        | 0.0057                        | 10 | 0.0045                       | 10 | 0.0063                         | 10 | 0.005                         | 10 |
|                                       | (0.00011)                     |    | (0.00009)                    |    | (0.00013)                      |    | (0.00011)                     |    |
| <i>Single Male</i>                    | 0.031                         | 10 | 0.0251                       | 10 | 0.0348                         | 10 | 0.0296                        | 10 |
|                                       | (0.00016)                     |    | (0.00013)                    |    | (0.00018)                      |    | (0.00015)                     |    |
| <i>Ln(Dividends)</i>                  | -0.0042                       | 10 | -0.0029                      | 10 | -0.0052                        | 10 | -0.0037                       | 10 |
|                                       | (0.00001)                     |    | (0.00001)                    |    | (0.00002)                      |    | (0.00001)                     |    |
| <i>Ln(Interest)</i>                   | -0.0007                       | 10 | -0.0005                      | 10 | -0.001                         | 10 | -0.0009                       | 10 |
|                                       | (0.00001)                     |    | (0.00001)                    |    | (0.00002)                      |    | (0.00001)                     |    |
| <i>Ln(Wage)</i>                       | 0.0006                        | 10 | 0.0006                       | 10 | 0.0008                         | 10 | 0.0009                        | 10 |
|                                       | (0.00001)                     |    | (0.00001)                    |    | (0.00001)                      |    | (0.00001)                     |    |
| <i>EIC</i>                            | 0.0062                        | 10 | -0.0022                      | 10 | 0.0121                         | 10 | 0.0032                        | 10 |
|                                       | (0.00049)                     |    | (0.00036)                    |    | (0.00055)                      |    | (0.00043)                     |    |
| <i>Sch A</i>                          | -0.0019                       | 10 | -0.0012                      | 10 | -0.0016                        | 10 | -0.001                        | 10 |
|                                       | (0.0001)                      |    | (0.00008)                    |    | (0.00012)                      |    | (0.0001)                      |    |
| <i>Paid Preparer</i>                  | -0.0174                       | 10 | -0.0149                      | 10 | -0.0191                        | 10 | -0.0168                       | 10 |
|                                       | (0.00012)                     |    | (0.0001)                     |    | (0.00014)                      |    | (0.00012)                     |    |
| <i>Homeowner</i>                      | -0.0087                       | 10 | -0.0057                      | 10 | -0.0097                        | 10 | -0.0067                       | 10 |
|                                       | (0.00011)                     |    | (0.00008)                    |    | (0.00012)                      |    | (0.0001)                      |    |
| <i>Student</i>                        | 0.0042                        | 10 | 0.005                        | 10 | 0.0063                         | 10 | 0.0071                        | 10 |
|                                       | (0.00029)                     |    | (0.00023)                    |    | (0.00032)                      |    | (0.00026)                     |    |
| <i>Gambler</i>                        | 0.005                         | 10 | 0.0026                       | 10 | 0.0094                         | 10 | 0.0065                        | 10 |
|                                       | (0.00034)                     |    | (0.00026)                    |    | (0.0004)                       |    | (0.00032)                     |    |
| Observations per Random Sample        | 10,000,000                    |    | 10,000,000                   |    | 10,000,000                     |    | 10,000,000                    |    |
| Average Adjusted R-Squared            | 0.103                         |    | 0.101                        |    | 0.119                          |    | 0.121                         |    |

**Note:** Table 6 presents the regression coefficients from the OLS model from equation (3) for the tax year 2021. *CMW Meme Volume Weight* is defined as the percentage of stock sales proceeds identified as meme stocks by Chacon, Morillon, and Wang (2022). *CMW Meme Equal Weight* is the percentage of unique stocks sold in a year that are identified as meme stocks by Chacon, Morillon, and Wang (2022). *HJZZ Meme Volume Weight* is defined as the percentage of stock sales proceeds identified as meme stocks by Hu, Jones, Zhang, and Zhang (2023). *HJZZ Meme Equal Weight* is the percentage of unique stocks sold in a year that are identified as meme stocks by Hu, Jones, Zhang, and Zhang (2023). All other variables are defined in Appendix A. For each column, a random sample of 10 million observations is taken from the population to estimate the coefficients. This procedure is done 10 times, and regression coefficients, standard errors, and adjusted R-squared are then averaged. Significance is then determined as the number of times the value was significant at the 1% level, with 10 meaning the coefficient was significant in all 10 random draws.