Profiling Turkish cryptocurrency owners

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Abstract: With ownership estimates of up to 25%, Turkey is at the forefront of cryptocurrency adoption rendering it an interesting example to study the proclaimed use cases of cryptocurrencies. Using exploratory factor analysis based on a sample of 745 Turkish cryptocurrency owners, we identify three different owner groups and their underlying motives. The first group (*users*) is looking at cryptocurrency as an option for payments, thereby disregarding its speculative element, while the second group (*investors*) can be described as experienced investors holding cryptocurrency as part of their investment strategy. The third group (*traders*) consists of risk-tolerant traders. Further analyses show that groups not only differentiate by demographics, income and education but also by factors such as ideology, purchase intention and the use of domestic or foreign exchanges. The results contribute to the understanding of Turkish cryptocurrency owners, their intrinsic and extrinsic motivations and can be incorporated into the pending regulatory processes in the country. Furthermore, the findings suggest that cryptocurrencies have outgrown the use case of mere speculation, provoking future research on cryptocurrency usage with regards to the theories of innovation diffusion, lead users and lead markets.

Keywords: Bitcoin, cryptocurrency, cryptocurrency adoption, alternative investments, individual investors, innovation diffusion

1 Introduction

With more than 300 million estimated (verified) users worldwide, the phenomenon of cryptocurrency has reached a state of non-negligible societal relevance (Crypto.com, 2022). Despite the Turkish government having banned cryptocurrency payments as a measure to protect the sovereignty of the Turkish Lira in April 2021 (TCMB, 2021), Turkey stands out

from other geographies with a very high cryptocurrency ownership rate between 16-25% double the European and US average (de Best, 2022; Exton and Doidge, 2018; Paribu, 2021). This makes Turkey a particularly interesting case to study cryptocurrency owners and their motivations. In December 2021, Turkey announced plans to further regulate cryptocurrencies, for among other things combating capital flight by restricting access to foreign cryptocurrency exchanges. However, a corresponding bill to that plan was postponed (Tamac and Öz, 2022). Cryptocurrency markets are permeated with ideological statements and narratives of constituting alternative, decentralized and censorship-resistant financial and economic systems (Steinmetz, 2023). One of the most important narratives in recent years was that cryptocurrency in general, and Bitcoin in particular, may serve as "safe-haven" assets to protect against inflation. While Bitcoin itself is subject to volatility and showcases pronounced correlations with other established financial markets (e.g., Ha and Nham, 2022), it may still be perceived trustworthy or the lesser evil in comparison to volatile domestic fiat currency. The high Turkish cryptocurrency adoption rate might thus be in part explained by the high inflation of the Turkish Lira (Sivrikaya, 2020). Several existing studies focus on cryptocurrency users of other countries (see, e.g., Steinmetz et al., (2021) for an overview). However, multiple studies show that cryptocurrency usage varies on the country-level (Alnasaa et al., 2022; Bhimani et al., 2022). Thus, profiling and characterizing Turkish cryptocurrency owners requires primary data. To the best of our knowledge, profiles and relevant characteristics of Turkish cryptocurrency holders remain mostly unknown up to this date.

Based on a dataset of 745 Turkish cryptocurrency owners from 2021, we apply exploratory factor analysis to identify and differentiate profiles and then empirically test the extent to which characteristics such as demographics, ideology, purchase intention, and the use of domestic or foreign exchanges drive the respective user groups. The methodological approach resembles existing studies with similar research questions but other thematic areas (e.g., Fisch et al. 2021; Pierrakis, 2019).

From a theoretical point of view, the study can be placed in the context of *self-determination theory (SDT)* (Deci and Ryan, 1985), a framework to assess the extent to which human behavior is driven by internal (e.g., ideological beliefs) or external (e.g., financial returns) motivation. By unraveling different ownership profiles, we can assess to what degree the actual use cases (e.g., payments, short-term speculation or long-term investment) drive certain groups and the degree to which ideology or national and foreign cryptocurrency exchange usage drive group affiliations. Thus, the findings contribute to research on individual investors in general (e.g., Barber and Odean, 2013) and specifically on individual investors in crypto assets (e.g., Ante et al., 2022; Steinmetz, 2021; Steinmetz et al., 2021). In addition, the characterization of Turkish cryptocurrency owners and their motivations informs the current regulatory debate in Turkey and also helps cryptocurrency service providers to better understand their potential customer base.

2 Sample and methodology

The survey data analyzed in this study has been collected by cryptocurrency data provider *CoinGecko* (coingecko.com) between January 27 and February 8, 2021, via *computer-assisted*

self-interviewing (CASI). It was distributed via *CoinGecko*'s geo-targeted website, the website and social media channels of *Kriptokoin* and the Turkish *YouTube* channels of *key opinion leaders (KOLs) alp-isik* and *kripto-sozluk.* The data has been used to publish a market report named *Cryptocurrency Awareness in Turkey 2021* (CoinGecko, 2021), that provides descriptive statistics on demographics, usage and attitudes with regard to cryptocurrencies. We thus only provide the most important descriptive results as part of the sample description. In addition, a methodology document describes the survey questionnaire as well as the processes of quality assurance and data preparation (Azmi, 2021). A total of 1,124 people participated in the survey, of which 745 (66%) completed the questionnaire. All of these 745 respondents stated that they are currently owning cryptocurrency.

The survey includes information on a) what people use cryptocurrencies for (i.e., investment / trade, payments / buying items or other purposes), b) their technological literacy proxied via the respondents' ability to read computer code and c) their financial literacy proxied via the number of different asset types owned. Further, it includes d) respondents' cryptocurrency experience proxied via the first time an individual purchased cryptocurrency, e) their cryptocurrency knowledge in terms of the number of different cryptocurrencies known, f) their trading frequency (i.e., how often they manage their portfolio) and finally e) a self-assessed score of their risk-taking attitude. These motives and characteristics of individuals are used to identify different user groups by means of exploratory factor analysis. Subsequently, regression analysis is applied to examine the extent to which the identified groups differ on the basis of socio-demographics (male gender, age in years, income in 1,000 Turkish lira, education as a score from 1 (no degree) to 6 (doctorate) and population density as the log-transformed population size of the district) and on other factors. These are dummy variables on (1) agreeing on the question that cash should be abolished (ideological motivation to own cryptocurrency), (2) answering that more cryptocurrency is likely to be purchased in the next six months (purchase intention) and answering that respondents use domestic (3) or foreign (4) cryptocurrency exchanges to purchase cryptocurrency against Turkish lira. The issue of market access via the respective exchanges provides an opportunity to explore the extent to which cryptocurrency access and trading is a phenomenon that only affects Turkey locally, or whether users also rely on international offerings that may (in the future) be regulated differently, thus making it a highly relevant topic for regulatory questions, e.g., with relation to consumer protection.

Of the 715 Turkish cryptocurrency owners, about 92% are male, 4% are female and the rest did not provide any information. The largest percentage of respondents (41%) were between 30 and 39 years old and have a university degree (77%). The most commonly owned cryptocurrencies are Ether (56%) and Bitcoin (50%), and 68% said they are active in the cryptocurrency space to invest, among other things. With 91%, the majority of people have bought cryptocurrencies via exchanges, of which international cryptocurrency exchange *Binance* (61%) and national cryptocurrency exchanges *BtcTurk Pro* (54%) and *Paribu* (43%) are most often used to exchange Turkish Lira into cryptocurrency.

3 Results

We conduct a principal component factor analysis with varimax rotation and Kaiser normalization, resulting in a three-factor solution that all have Eigenvalues >1. Table 1 shows the factor loadings, for which we define a threshold of 0.4 to assign them to a factor. All variables but trading frequency load on a single factor. We assign trading frequency to the largest loading, i.e., factor 3. The three identified factors explain 48% of the variance and the *Kaiser-Meyer-Olkin (KMO)* measure (0.52) and Bartlett's test of sphericity ($p<.01$) indicate that factor analysis is an appropriate methodology.

Table 1. Factor analysis of motives and characteristics of owning cryptocurrency.

Variable	Factor 1	Factor 2	Factor 3
Interpretation	Users	Investors	Traders
1. Use for payments	**0.789**	0.021	0.023
2. Use as investment / for trading	**-0.737**	0.102	0.058
3. Technological literacy	**0.416**	0.213	-0.052
4. Financial literacy	-0.022	**0.641**	0.066
5. Cryptocurrency experience	0.207	**0.633**	0.195
6. Cryptocurrency knowledge	-0.033	0.108	**0.628**
7. Trading frequency	0.152	-0.489	**0.614**
8. Risk-taking	-0.155	0.296	**0.594**
Variance explained	17.9%	15.1%	14.7%

We coin the three factors (1) users, (2) investors and (3) traders, representing different cryptocurrency owner groups of Turkish individuals. The first factor (*users*) comprises the usage of cryptocurrency for payments (+), investment (-) and technological literacy (+). Cryptocurrency owners in this section have a high degree of technical expertise and are uninterested in the investment or speculative characteristics of cryptocurrencies, but care about its option as a means of payment. The fact that non-speculative (but still financial) motives represent the factor with the largest share of the variance is in line with Steinmetz (2021), who outlines that such motives may be less prevalent in the media or the academic literature but still are highly relevant. The second factor (*investors*) comprises the variables financial literacy (+) and cryptocurrency experience (+), indicating that these individuals are investors with a long(er) time horizon, as also indicated by the high negative factor loading of trading frequency. Finally, factor 3 (*traders*) comprises the degree of knowledge about different cryptocurrencies (+), trading frequency (+) and risk-taking (+), thus indicating that these individuals are highly active traders that frequently buy and sell cryptocurrency.

Table 2 shows correlations of various variables with the factor loadings of the individual groups as dependent variables (one factor per model) based on an OLS regression. For the group of

cryptocurrency users, we identify a positive significant influence of ideology and a negative one for short-term purchase intention. For the group of investors, we also identify a (more pronounced) negative relationship with short-term purchase intention. Furthermore, we find that the use of domestic exchanges drives investor group membership, as do male gender, higher income, and higher education. Similarly, for male gender and higher education, we also find a significant relationship for the trader group (factor 3). In contrast to users and investors, we identify a significant positive effect of short-term purchase intention for traders. Furthermore, we find significant effects for both domestic and foreign exchanges, with the effect for foreign exchanges being significantly higher.

Table 2. Profiling Turkish cryptocurrency owners based on demographics and other factors

	(1)	(2)	(3)
	Coeff. (SE)	Coeff. (SE)	Coeff. (SE)
Demographics			
Gender	-0.073 (0.181)	0.500 (0.172)***	0.020 (0.187)
Age	-0.012 (0.049)	-0.068 (0.047)	-0.002 (0.051)
Income	0.007 (0.015)	0.066 (0.015)***	0.014 (0.016)
Education	-0.026 (0.045)	0.143 (0.043)***	0.093 (0.046)**
Population (log)	0.003 (0.031)	0.044 (0.030)	0.093 (0.046)
Other factors			
Ideology	0.369 (0.081)***	0.057 (0.077)	-0.060 (0.084)
Purchase intention	-0.286 (0.144)**	-0.441 (0.139)***	0.376 (0.151)**
Domestic exchanges	-0.118 (0.091)	0.354 (0.087)***	0.167 (0.094)*
Foreign exchanges	0.010 (0.083)	0.051 (0.079)	0.223 (0.086)***
R^2 (adj. R^2)	0.05 (0.03)	0.13 (0.11)	0.05 (0.03)
Dependent variable	Users	Investors	Traders

*, **, *** indicate significance at the 10%, 5% and 1% level; N = 581.

4   Conclusion

To the best of our knowledge, this study is the first to profile and characterize Turkish cryptocurrency owners. The results provide the key insight that there is no such thing as "the crypto owner", but user groups need to be distinguished. We find evidence for three distinct groups of owners: (1) users, (2) investors, and (3) traders. Users are the (statistically) most significant group and can be described as payment-oriented and ideologically-driven cryptocurrency owners. This is contrary to recent research suggesting that US-based cryptocurrency owners in general do not see cryptocurrency as a fiat currency alternative (Auer and Tercero-Lucas, 2022). This difference can possibly be explained against the backdrop of

the past and present economic, political and fiscal and circumstances in Turkey. Especially the high inflation of the Turkish Lira may drive individuals in Turkey towards cryptocurrencies as an alternative option for conducting payments and retaining purchasing power, even though cryptocurrencies themselves are fairly volatile (e.g., Walther et al., 2019; Sivrikaya, 2020). Future studies of cryptocurrency usage should distinguish between different types of cryptocurrencies, i.e., including stablecoins (e.g., Fiedler and Ante, 2023; Hoang and Baur, 2021), which facilitate fiat-pegged, low volatility crypto-assets that might be(come) the preferred choice of this user group.

Similar to Turkey, various other countries experience high levels of inflation, economic fragility and low consumer confidence recently, but without similarly high levels of cryptocurrency adoption. This raises the question for additional reasons inducing Turk's high level of cryptocurrency affinity and whether Turkish cryptocurrency owners can be classified as "lead users" whose needs are representative for those of users in other markets in the future (von Hippel, 1986). On that basis, future studies of technology acceptance and innovation diffusion should also investigate the question whether Turkey can even play a role as a "lead market" (Beise and Cleff, 2004) for cryptocurrencies. This would allow a contribution to the broader understanding of (international) innovation diffusion (Rogers, 2003) with regard to cryptocurrency adoption.

With reference to the possible future regulation of (foreign) cryptocurrency exchanges in Turkey, the results also offer the insight that foreign exchanges do not seem to be a significant metric for the *user* group, while the *investor* group seems to prefer domestic exchanges. Only the relatively (statistically) smallest group of *traders* shows higher statistical correlations to foreign exchanges. This can be interpreted as an indication that a majority of the people who might be targeted by the discussed regulation, *users* and *investors*, may hardly be affected. Rather, such regulation would mainly affect the third group of *traders*, who increasingly use foreign exchanges in addition to local ones.

References

Alnasaa, M., Gueorguiev, N., Honda, J., Imamoglu, E., Mauro, P., Primus, K., Rozhkov, D., 2022. Crypto-assets, corruption, and capital controls: Cross-country correlations. Econ Lett 215, 110492. https://doi.org/10.1016/j.econlet.2022.110492

Ante, L., Fiedler, I., Meduna, M. von, Steinmetz, F., 2022. Individual Cryptocurrency Investors: Evidence from a Population Survey. International Journal of Innovation and Technology Management 19, 2250008. https://doi.org/10.1142/S0219877022500080

Auer, R., Tercero-Lucas, D., 2022. Distrust or speculation? The socioeconomic drivers of U.S. cryptocurrency investments. Journal of Financial Stability 101066. https://doi.org/10.1016/j.jfs.2022.101066

Azmi, E., 2021. Cryptocurrency Awareness in Turkey 2021 [WWW Document]. CoinGecko. URL https://bit.ly/3qu7GNu (accessed 9.8.22).

Barber, B.M., Odean, T., 2013. The Behavior of Individual Investors, in: Handbook of the Economics of Finance. Elsevier B.V., pp. 1533–1570. https://doi.org/10.1016/B978-0-44-459406-8.00022-6

Beise, M., Cleff, T., 2004. Assessing the lead market potential of countries for innovation projects. Journal of International Management 10, 453–477. https://doi.org/10.1016/j.intman.2004.08.003

Bhimani, A., Hausken, K., Arif, S., 2022. Do national development factors affect cryptocurrency adoption? Technol Forecast Soc Change 181, 121739. https://doi.org/10.1016/j.techfore.2022.121739

CoinGecko, 2021. Cryptocurrency Awareness in Turkey 2021 [WWW Document]. CoinGecko. URL https://assets.coingecko.com/reports/Surveys/2021-Turkey-Cryptocurrency-Survey.pdf (accessed 9.8.22).

Crypto.com, 2022. Crypto Market Sizing [WWW Document]. URL https://assets.ctfassets.net/hfgyig42jimx/5i8TeN1QYJDjn82pSuZB5S/85c7c9393f3ee67e456ec780f 9bf11e3/Cryptodotcom_Crypto_Market_Sizing_Jan2022.pdf (accessed 9.10.22).

de Best, R., 2022. Share of respondents who indicated they either owned or used cryptocurrencies in 56 countries and territories worldwide from 2019 to 2021 [WWW Document]. Statista. URL https://www.statista.com/statistics/1202468/global-cryptocurrency-ownership/ (accessed 9.11.22).

Deci, E.L., Ryan, R.M., 1985. Intrinsic Motivation and Self-Determination in Human Behavior. Springer US, Boston, MA. https://doi.org/10.1007/978-1-4899-2271-7

Exton, J., Doidge, F., 2018. Cracking the code on cryptocurrency [WWW Document]. ING International Survey Mobile Banking. URL https://think.ing.com/uploads/reports/ING_International_Survey_Mobile_Banking_2018.pdf (accessed 9.10.22).

Fiedler, I., Ante, L., 2023. Stablecoins, in: Baker, K.H., Benedetti, H., Nikbakht, E., Stein Smith, S. (Eds.), The Emerald Handbook on Cryptoassets: Investment Opportunities and Challenges. Emerald Publishing Limited.

Fisch, C., Masiak, C., Vismara, S., Block, J., 2021. Motives and profiles of ICO investors. J Bus Res 125, 564–576. https://doi.org/https://doi.org/10.1016/j.jbusres.2019.07.036

Ha, L.T., Nham, N.T.H., 2022. An application of a TVP-VAR extended joint connected approach to explore connectedness between WTI crude oil, gold, stock and cryptocurrencies during the COVID-19 health crisis. Technol Forecast Soc Change 183, 121909. https://doi.org/10.1016/j.techfore.2022.121909

Hoang, L.T., Baur, D.G., 2021. How stable are stablecoins? The European Journal of Finance 0, 1–17. https://doi.org/10.1080/1351847X.2021.1949369

Paribu, 2021. Paribu, yeni yıla 5 milyon kullanıcıyla giriyor [WWW Document]. URL https://www.paribu.com/blog/haberler/paribu-yeni-yila-5-milyon-kullaniciyla-giriyor/ (accessed 9.10.22).

Pierrakis, Y., 2019. Peer-to-peer lending to businesses: Investors' characteristics, investment criteria and motivation. The International Journal of Entrepreneurship and Innovation 20, 239–251. https://doi.org/10.1177/1465750319842528

Rogers, E.M., 2003. Diffusion of Innovations, 5th ed. Free Press, New York.

Sivrikaya, A., 2020. The Relationship Between Bitcoin Trade Volume and Inflation Uncertainty: Evidence from Turkey. Third Sector Social Economic Review. https://doi.org/10.15659/3.sektor-sosyal-ekonomi.20.12.1506

Steinmetz, F., 2023. The interrelations of cryptocurrency and gambling: Results from a representative survey. Comput Human Behav 138, 107437. https://doi.org/10.1016/j.chb.2022.107437

Steinmetz, F., 2021. Behavioural clusters of cryptocurrency users: Frequencies of non-speculative application domains. BRL Working Paper Series.

Steinmetz, F., von Meduna, M., Ante, L., Fiedler, I., 2021. Ownership, uses and perceptions of cryptocurrency: Results from a population survey. Technol Forecast Soc Change 173, 121073. https://doi.org/10.1016/j.techfore.2021.121073

Tamac, B., Öz, E., 2022. Opinion - Lessons From the Turkish Government's Hasty Attempt to Regulate Cryptocurrencies [WWW Document]. CoinDesk. URL https://www.coindesk.com/layer2/2022/08/03/lessons-from-the-turkish-governments-hasty-attempt-to-regulate-cryptocurrencies (accessed 9.10.22).

TCMB, 2021. Press Release on Payments Area [WWW Document]. Central Bank of the Republic of Türkiye . URL https://www.tcmb.gov.tr/wps/wcm/connect/d95ee526-10cb-46c7-aa88-add68a9c1993/ANO2021-17.pdf?MOD=AJPERES&CACHEID=ROOTWORKSPACE-d95ee526-10cb-46c7-aa88-add68a9c1993-nzp3dra (accessed 9.10.22).

Von Hippel, E. (1986). Lead users: a source of novel product concepts. Management science, 32(7), 791-805. https://doi.org/10.1287/mnsc.32.7.791

Walther, T., Klein, T., Bouri, E., 2019. Exogenous drivers of Bitcoin and Cryptocurrency volatility – A mixed data sampling approach to forecasting. Journal of International Financial Markets, Institutions and Money 63, 101133. https://doi.org/10.1016/j.intfin.2019.101133

Declarations

Availability of data and materials

For more information, please contact the corresponding author.

Conflicts of interest

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