

Bits Under the Mattress

Understanding Different Risk Perceptions and Security Behaviors of Crypto-Asset Users

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Motivation of the Research

- ~ 100 million unique crypto-asset users
- Wide choice of key storage options
- 4 million bitcoins are considered to be lost.

Who are the crypto-asset users? How do they handle keys?

Participant Recruitment

We surveyed **395 crypto-asset users** from Europe and North America in early 2020, in English and German. To improve coverage in a hard-to-reach population, we recruited participants by **a new combination of deep and broad sampling**:

| | | |
|--|-------------------|--------------------|
| 195 participants recruited from crypto-communities; | 3-4 years | USD 5k-10k |
| 200 participants recruited through a commercial panel. | 3-4 years | USD 10k-100k |
| | Median experience | Median investments |

Survey Design

We surveyed participants on 5 psychometric constructs:

- Perceived vulnerability:** the perceived likelihood of private keys or accounts being compromised;
- Perceived severity:** the perceived impact of harm caused by the loss of crypto-assets;
- Perceived self-efficacy:** the perceived capability to secure keys and prevent the theft of crypto-assets, e. g.:

I am able to protect my private keys from being stolen.

Strongly disagree 1 2 3 4 5 Strongly agree

- Response cost:** the estimated cost or inconvenience associated with securing crypto-assets;
- Perceived concern:** the level of concern about broader security risks related to crypto-assets.

We then asked them about their **security behavior**, e. g.:

How often do you back up your crypto wallet?

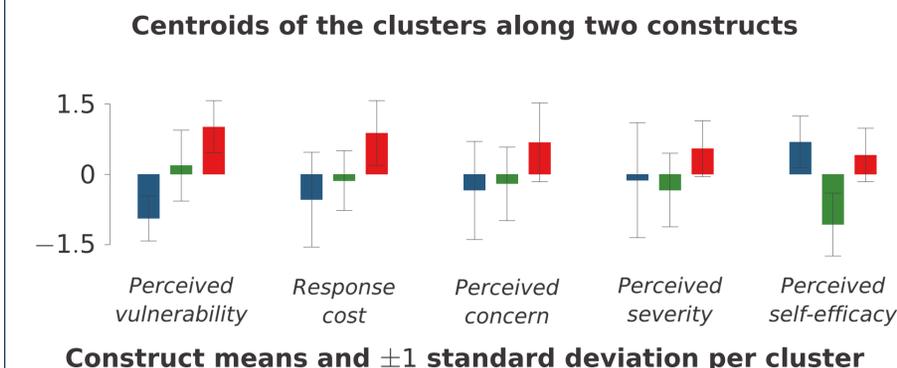
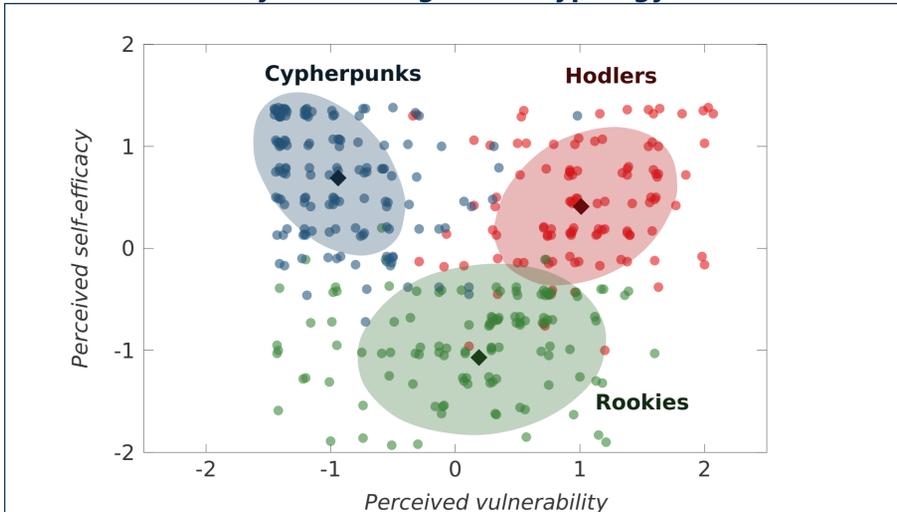
Rarely Occasionally Regularly

A Robust Typology of Crypto-Asset Users

We identified a typology of **3 user personas**:

- Cypherpunks**
 - Tech-savvy adopters and early enthusiasts
 - Ideological and technological interest
 - Mostly men (88%) around 25-44 years old
- Rookies**
 - Casual users with fear of missing out
 - Interest in long-term financial profits
 - Higher prop. of women (33%) and seniors
- Hodlers**
 - Traders (including on stock markets)
 - Every fourth invests more than \$100k.
 - Mostly men (80%) around 35-44 years old

The Cluster Analysis Leading to the Typology

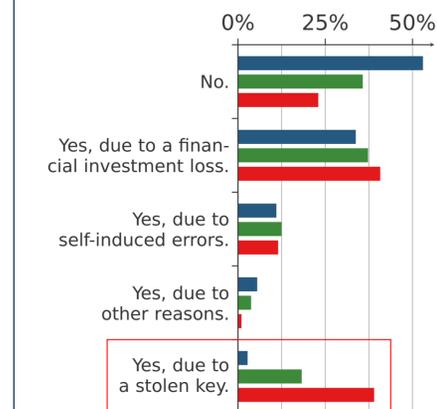


Understanding Security Behavior

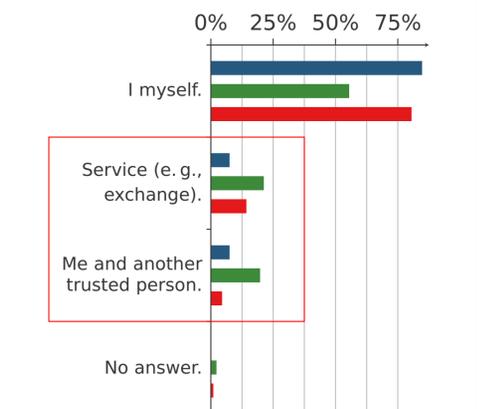
Almost 40% of the hodlers suffered substantial losses due to stolen keys.

Rookies entrust their keys to third parties more than other user personas.

Have you ever lost a substantial amount of crypto-assets?



Who has control over private keys for most of your crypto-assets?



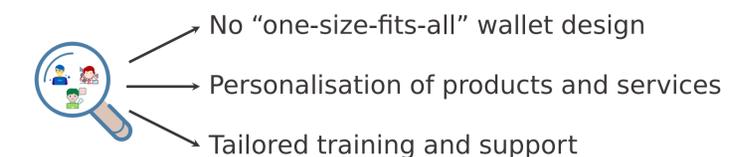
How often do you undertake the following security practices?

Scale: rarely, occasionally, regularly. %

| Practice | rarely | occasionally | regularly |
|--|--------|--------------|-----------|
| I back up my crypto wallet. | 9 | 32 | 59 |
| I encrypt backups for additional security. | 23 | 29 | 48 |
| I enable a MFA for my online accounts. | 43 | 33 | 23 |

Design Implications

Crypto-asset users are not homogeneous.



Reference:

S. Abramova, A. Voskobojnikov, K. Beznosov, and R. Böhme. "Bits Under the Mattress: Understanding Different Risk Perceptions and Security Behaviors of Crypto-Asset Users." In *Conference on Human Factors in Computing Systems (ACM CHI)*. (virtual) Yokohama, Japan, 2021.

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