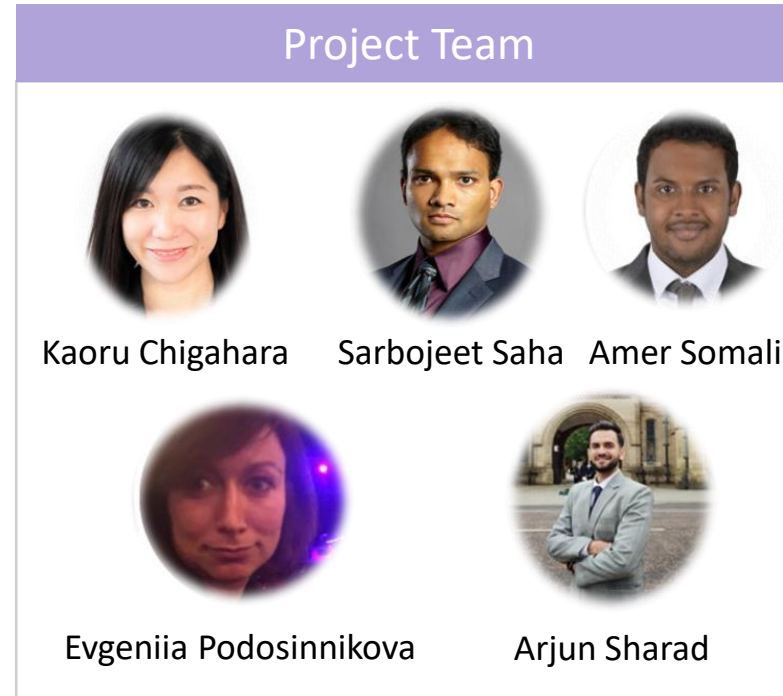


# Stablecoins as a Payment Method (SaaPM)



Understanding the Landscape, Market Size, and  
Future for Consumer-Driven Stablecoin Payments

*FOR PUBLIC RELEASE*

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## PRESENTATION OBJECTIVES

- Examine the current regulatory and technological landscape for stablecoin-based consumer payments
- Understand key drivers and blockers of adoption
- Provide expert analysis and opinion, market research, and data on usage statistics
- Explain consumer views about stablecoins for payments
- Inspect merchant attitudes towards cryptocurrency payments in general
- Project scenarios of online merchant acceptance
- Provide recommendations for current and future work in SaaPM

## AGENDA

- 1 Background & Methodology
- 2 The Regulatory Landscape
- 3 State of Technology
- 4 CBDCs
- 5 Expert Opinions on SaaPM
- 6 SaaPM Use Cases
- 7 Consumer Views of SaaPM
- 8 Stablecoin Payments Market Sizing
- 9 Merchant Crypto Payments Adoption Scenarios
- 10 Conclusions & Recommendations



## Executive Summary

### Business Situation

1. Analyse customer views of stablecoin payments
2. Establish likely target available market for stablecoin payments by volume
3. Examine scenarios for stablecoin adoption and drivers/blockers thereof

### Methodology

#### Phase 1 – Mapping Out the Landscape

- External SME interviews with academics, regulators, FinTech/Crypto experts, and payment processing experts
- **Define landscape** and barriers to/drivers of adoption

#### Phase 2 – Establishing the Business Case

- Customer surveys, interviews with merchants, exchanges, and payment processors
- **Quantify & specify** target available market & opportunity

### Findings

- Our estimate of likely size of stablecoin payments market over next 24 months: **< US\$5B**
- Consumers surveyed generally have a positive view of stablecoins for payments, but fundamental disconnects exist between merchants and customers with respect to SaaPM
- Drivers of merchant adoption include regulatory clarity surrounding cryptoasset payments, NFT market growth, CBDC adoption, and digital penetration of developing markets
  - *CBDCs are unlikely to be adopted widely in developed nations for at least 3 years, if at all*
- Most likely scenario is a merchant adoption rate of **20% for cryptoasset payments in general** within next 5 years

### Conclusions & Recommendations

- **No large-scale market for SaaPM at the present time - however, market is developing and growing extremely rapidly**
- Test cases for SaaPM adoption should be run in **Singapore only** with at least 1,000 participants
- **Firms interested in stablecoin payments should consider first experimenting with in-house stable tokens for rapid facilitation of cross-border settlements, then launching own stablecoin**



# PART I: MARKET DEFINITION & LANDSCAPE



# 1. Background & Methodology

- Defining the project scope
- Initial hypotheses
- Project methodology



## Business Situation Overview

### Our Core Question ?

*Does consumer demand exist to drive the adoption of accepting **stablecoins** as a method of payment?*

#### Definitions

- **Stablecoin** is a specialised form of cryptocurrency where the price of the coin is pegged to the value of another asset
- Often, but not always, redeemable for physical holdings of underlying assets

#### Currency-Backed

#### Commodity-Backed

Single Fiat

Algo

Crypto



### Critical Additional Questions 🔍

#### Market Scan

- Dominant current stablecoin use cases?
- What products and services can be paid for with them?
- Incentives for consumers to use them?

#### Perceptions

- Consumer views of stablecoins as a payment method?

#### Opportunity

- How can stablecoins be used in B2B payments?

#### Challenges

- Blockers to adoption?

### Initial Hypotheses 💡

**Regulatory environment is most favourable in the USA**

**Adoption of stablecoins for daily payments most likely in East Asian markets**

**CBDCs pose a significant potential threat to stablecoins as a payment method**

**Stablecoins can be easily adapted into an actual payments method within next 1-3 years**



# Project Methodology

## Overall Flow and Core Objectives

### Desk Research

Gain understanding of current market & regulatory views, drivers of, blockers to adoption

**Phase 1: Academic articles (Academia.edu, UoM archives), research analyst reports (Frost & Sullivan, Statista, The Block Crypto), case studies**

### Interviews

#### Market Variable Identification

Focus on interviews with experts to understand value proposition to end-consumers.

**Phase 1: 30+ SME interviews**

**Phase 2: ~ 20 Merchant interviews, ≥100 Customer Survey responses**

### Analysis

#### Target Geographies & Coins

Analysis of information and data collected to identify best target geographies for market entry

#### Financial Modelling

Identify likely potential size of stablecoin consumer payments market in 2022-23

### The Way Forward

#### Recommendations

Specify scenarios and use cases under which stablecoins adoption is viable, with financial projections wherever possible



## 2. The Regulatory Landscape

- Overall shape of current global regulations
- Examples of regulations by country
- Known regulatory concerns with stablecoin pegs



# Diversity of Global Regulatory Landscape for Stablecoin Payments

## UK

- Has endorsed stablecoin payments as of April 2022 (Septon 2022)
- Significant startup & market interest in GBP stablecoins
- UK FCA adopts more accommodative stance to encourage innovation**

## EU

- Regulators are not harmonised in their views, are adopting a more hands-off approach.
- MiCA makes clear distinction between e-money equivalents and digital speculative assets

## Nordics

With their small populations and robust financial systems, are more likely to permit adoption

## France

Open to stablecoins, welcomes financial innovation through cryptocurrency development

## Switzerland (Frost & Sullivan, 2020)

- Well-known adopter of Blockchain technology and emerging hub for Blockchain innovation
- Government proposed relaxing laws for Blockchain and crypto startups, entitles FINMAN with discretionary powers to relax rules affecting decentralised securities trading

## Germany and Italy

Quite strict in regulating stablecoins after the Wirecard fraud (Germany) and due to known issues of fraud in their banking system (Italy)

## Russia

Central Bank wants to ban cryptocurrencies – Finance Ministry opposes such action  
(Frost & Sullivan 2020, Baydakova 2022)

## Japan

Regulators take more liberal approach to stablecoins  
Treats stablecoins as digital money

## South Korea

Busan proposed to accept UST for payments (Alper 2021)

## China

Seeks to issue its own CBDCs and will not tolerate private stablecoins

## Singapore and Thailand

Separate regulatory regimes for stablecoins vs other cryptos. Thailand has BANNED cryptocurrency payments in general, as of April 2022.

## Nigeria

Ban on any dealing with cryptocurrencies  
(The Block Research Report 2021)

## Turkey

Ban use of cryptocurrency payments  
(The Block Research Report 2021)

## El Salvador

Bitcoin is already legal tender

## US

- In 2021, US bank regulator (OCC) allowed US banks to use stablecoins as payments (The Block Research Report, 2021)
- Seeks to regulate USD-only fiat-backed stablecoins like banks**
- Significant concern among regulators of quality of collateral**

## Canada

Very hostile to crypto-assets in general



All insights gained from SME interviews, except where sources given



## Regulatory Adaptations to New Realities



### US – Regulate Issuers as Narrow Banks



Currently, USD-backed stablecoins likely to be regulated like banks – onerous, expensive, stifles innovation

Proposed *narrow banks* take the underlying fiat money, keep it on hand, issue stablecoin backed 1:1 against reserves

**Would have 100% reserve-backed issuance**, inspected by bank regulators

**Zero liquidity risk** - no fractional lending against reserves.

### EU - MiCA Framework for Issuers



Under *Markets in Crypto Assets (MiCA)* regulation\*, stablecoins which are:

1. Linked to single currencies → will be treated as **advanced form of e-money**
2. Backed by algorithm, many currencies, or commodities → will be treated as **digital assets, subject to taxation**
3. Not pegged against fiat money (i.e., pegged against, **but not redeemable for, gold**) → will be **potentially** considered as money.

\* The current proposal only covers centralised asset-backed stablecoins

### UK – Currently Seeking Opinions



UK proposes to permit stablecoin payments and will permit issuers to operate under “certain conditions” (Septhon 2022)

Government continues to seek opinions and views from industry through May 2022 (ibid)

UK is not as strict as other countries, and the **regulation is at a good level where it allows for innovation to happen within the space**

Regulators have significant concerns about systemic risk and fraud

### Asia (Japan, Singapore, Thailand) – More Lenient Stance



Japan: Usage of stablecoins may affect solvency and stability with potential systemic risk. **Looking to create a regulatory framework for stablecoins.**

Singapore: **Treats stablecoins as almost equivalent to cash** under the Payment Service Act. Issuers require MAS license.

Thailand: **Stablecoin payments have been BANNED as of April 2022**, but this may change in the near future as the BoT and TSEC are willing to review this over time.



## Fundamental Credibility of Stablecoin Pegs



### Untethered Reserves



- USDT is world's most valuable stablecoin – market cap > US\$75B as of Feb 2022, over 45% of total stablecoin circulation
- Tether **claims** to be fully collateralised against issued coins
- CFTC investigation revealed only 27.6% of issued coins held in fiat currency *(CFTC 2021)*
- Tether Corp. & Bitfinex (exchange) subsequently fined over US\$40M *(CFTC 2021)*
- Tether released breakdown of holdings in March 2021:
  - 76% cash & short-term debt, e.g. CP & Treasuries
  - 13% secured loans
  - 11% corp. bonds, mutual funds, precious metals
- *Less than 4% of USDT reserves are actual cash - if just 1 in 25 Tether users redeem simultaneously, Tether fails*



### Wider Market Impacts



- *Are other stablecoin pegs really credible?*
  - Circle's USDC is supposedly fully audited
  - MakerDAO's DAI is overcollateralised with Bitcoin
  - USDT remains #1 stablecoin, by huge margins
  - *Why?* Significant first-mover market advantages
  - **Market does not see stablecoin pegs as a problem**
- *Is a "risky" deposit base really a problem?*
  - USDT **transforms risky, relatively illiquid** assets (corporate paper, loans, bonds) into **safe, liquid ones** (cash-redeemable digital tokens)
  - Performs a useful and critical market function that permits Tether investors to make gains on yields





# 3. The State of Technology

- Technological barriers to SaaPM adoption
- Proposed solutions and market developments



## Technological Obstacles to Stablecoin Payments Adoption

### Speed



- Blockchain transactions are *extremely* slow relative to existing payment methods
- Payment processing via ERC-20 protocol can take up to 30min on the ETH blockchain
- Slow speeds make stablecoin simply impractical at present for consumer payments

### Scalability



- Ethereum blockchain runs 9-30 transactions per second (TPS)
- VISA/MasterCard/AMEX can *easily* manage at least 10K TPS
- Most major stablecoins exist as smart contracts on Ethereum blockchain
- Each transaction must be individually validated – extremely slow and costly

### Fees



- Ethereum network charges *gas fees* to permit transactions to be processed
- Such fees range from US\$10-250 and are **highly** volatile
- Payments with Uniswap and other protocols can cost up to US\$700
- Small daily payments completely cost-ineffective with USDT or USDC

### AML/KYC Issues

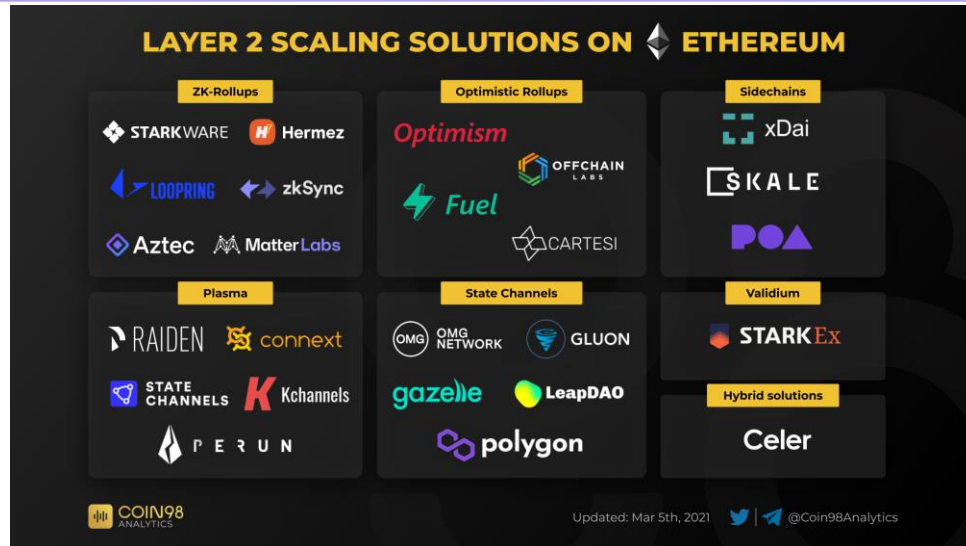


- Anonymity of cryptocurrencies pose significant regulatory concerns for terrorist financing and other illegal activities
- Blockchain technologies greatly blunt impact of existing AML/KYC rules
- Stablecoin issuers need to prove that they have strong AML/KYC procedures in place



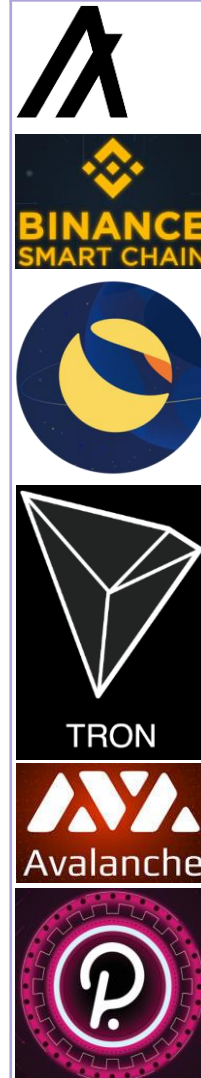
## Every Problem Has Clear Solutions

### Layer 2 Solutions



- Numerous highly innovative solutions to speed & scalability issues currently proposed & implemented
  - Zero-knowledge rollups, sharding, state channels, optimistic rollups, sidechains
- Layer 2 solutions** have *already* been implemented for Bitcoin (Lightning network) and Ethereum (Plasma network)
- Increases both speed and transaction volume to near-instantaneous settlement**

### New High-Speed, Low-Cost Protocols



- Numerous solutions already exist to solve the speed, scalability, and cost issues
- USDT and USDC can already be processed and settled on non-Ethereum chains*
  - Algorand** provides scalability and speed for Ethereum smart contracts (USDT, USDC)
  - Binance Smart Chain** allows ERC-20 transactions at a fraction of the cost
  - Terra** allows for extremely fast (< 1min), extremely low cost (~\$0.0005) transactions through native LUNA/UST tokens
  - TRON** is already processing more USDT transactions than Ethereum
  - Avalanche**, Cosmos blockchains similarly allow for fast processing of transactions
  - Polkadot** provides *bridging solutions*, connecting multiple blockchains together



# 4. Central Bank Digital Currencies

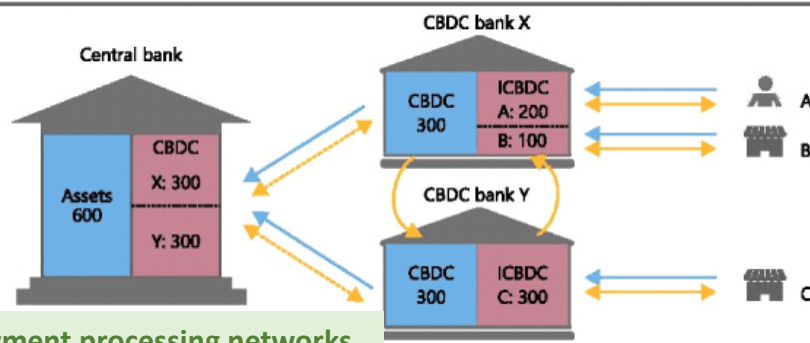
- Definitions of wholesale and retail CBDCs
- Current and future CBDC projects



# Introduction to CBDCs

(Onoreme 2020)

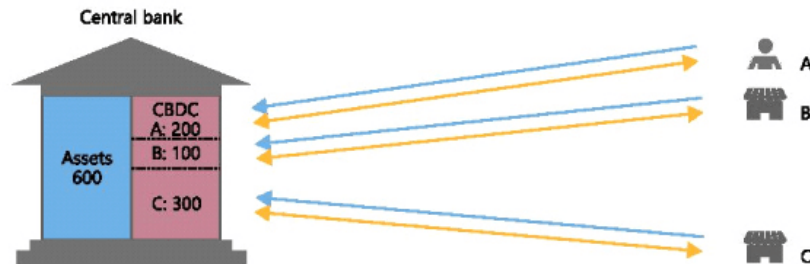
## Indirect CBDC (synthetic/ two-tier/ multi-cell)



- ICBDC is a claim on an intermediary
- Intermediaries onboard (KYC) and handle retail payments
- Central bank handles wholesale payments

Strong need for payment processing networks

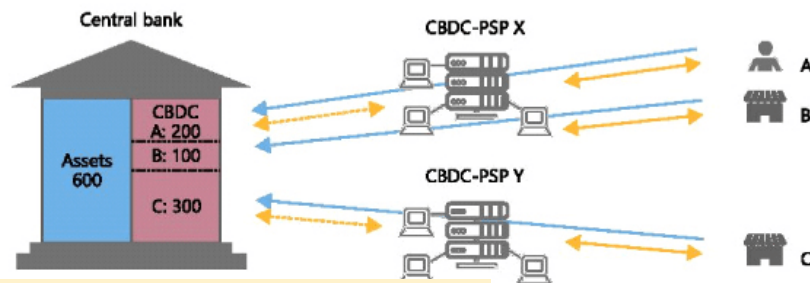
## Direct CBDC (digital banknotes/ central bank accounts/ single-cell/ central bank cryptocurrency)



- CBDC is a claim on central bank
- Intermediaries or central bank onboard (KYC)
- Central bank handles retail payments

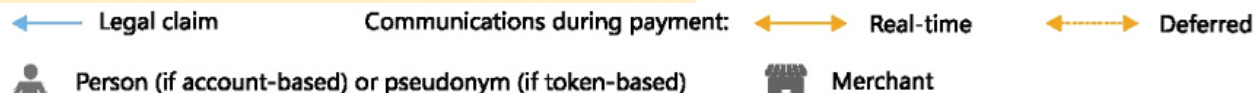
NO NEED for payment processors at all

## Hybrid CBDC



- CBDC is a claim on central bank
- Intermediaries onboard (KYC) and handle retail payments
- Central bank periodically records retail balances

Payment processors provide KYC &amp; onboarding facilities



## Why Introduce CBDCs?

- Reach *unbanked* populations to assist those who cannot access traditional financial products
- Facilitate cross-border settlements & payments
- Provide fuller control over domestic money supply than existing methods
- Inject liquidity *DIRECTLY* into economy, rather than through banks

## Open Questions Around CBDCs

- What kind of blockchain will be used? Private blockchains are a non-starter
- What level of user anonymity will be permitted? (Pure CBDC almost completely destroys anonymous transactions)
- Is a CBDC even practical or feasible in a large economy?
- How will governments and users (banks, customers, merchants) interact with CBDCs?



# Mapping the CBDC Landscape

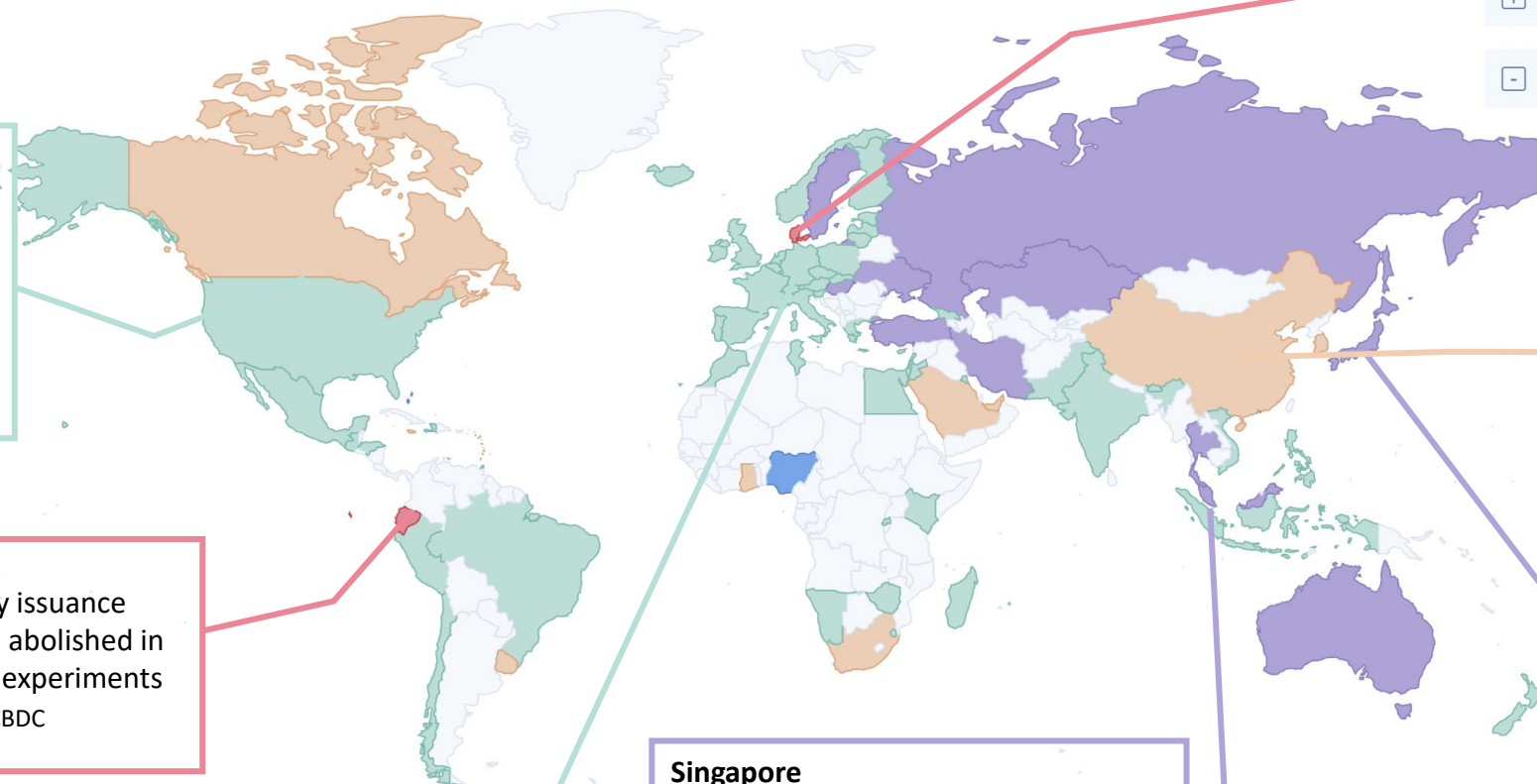
Map & data from  
CBDC Tracker

(CBDC Tracker 2022),  
interpretation  
from expert  
interviews except  
where noted

## Today's Central Bank Digital Currencies Status

Database update: February 2022 • News update: Feb, 15 22

Cancelled Research Proof of concept Pilot Launched Show all



### Denmark

CBOD *cancelled* plans for e-kroner because benefits do not outweigh costs of implementation and loss of user anonymity/privacy (CBDC Tracker 2022)

### China

**HYBRID CBDC** model (Chorzempa 2021) planned due to extreme complexity of pure CBDC model  
Direct-to-consumer digital banking already omnipresent due to Alipay & TenCent  
Central bank digital yuan almost certain to be introduced due to CCP's desire to maintain absolute control over monetary system  
Private cryptocurrencies essentially banned

### Japan

BoJ **unlikely** to introduce Japanese yen CBDC within next 1-3 years  
Significant concerns about monetary control over CBDCs  
Market view: are CBDCs really necessary, given utility of private stablecoins?

### US

Regulators are interested in the concept – pilot initiated by Boston FED

### Canada

Currently in pilot stage

### Ecuador

Country's initial e-money issuance was not trusted and was abolished in 2017; subsequent CBDC experiments have been abandoned (CBDC Tracker 2022)

### Switzerland

BIS & SNB recently wrapped up *Project Helvetia* PoC for CBDC  
Quite likely to adopt **hybrid** CBDC for Swiss Franc

### Singapore

Ready in term of technological readiness) to issue **hybrid** CBDC  
Likely to be a game changer for bank settlements and fiat transaction processing  
MAS currently running PoC



## 5. Expert Opinions on SaaPM

- Viability of stablecoin payments market
- Likely size and volumes
- Core areas of growth and opportunity
- Alternative views of SaaPM



## Expert Views on Stablecoin Payments

### How Big Will Stablecoin Payments Be?



*"This is very hard to say – the picture right now is just not very clear. **Max 1% of current payments market, and most of that would be concentrated in online shopping, not in physical retailers**" - FinTech Expert*

### Where are the Biggest Opportunities?



Serious potential in **developing economies, e.g. Africa** - stablecoins allow those countries to bypass retail banking and go straight to digital

### Who and What Will Be Early Adopters?



#### Business (B2B)

- 4 interviewees strongly argue that B2B adoption will be starting point of stablecoin payments
- Financial institutions are likely to be first adopters – dependent on scaling solutions for current technology



#### Consumer (B2C)

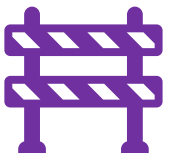
- First adopters will be young digital natives (20-45 age range)
- Merchant acceptance will drive adoption
- Online gaming, Metaverse, travel

### What are the Biggest Use Cases?



1. Trading & hedging volatile cryptos
2. Cross-border remittances & payments (12 of 30 interviewees)
3. dAPP payments & DeFi applications (e.g. automated insurance smart contract payouts)
4. Online gaming & microtransactions (2 of 30 interviewees)
5. E-Commerce payments
6. In-store retail payments (niche market)

### What is Currently Preventing Mass Adoption of Stablecoin Payments?



- Consumers lack **awareness and understanding** of the technology
- Average users don't know how to get started with using stablecoins
- Regulators and financial institutions lack **trust in cryptos**
- Consumers don't have a one-stop solution enabling easy access to stablecoin payments and technology

### An Alternative Point-of-View



- No real gap in payments market that stablecoins can fill (6 of 30 interviewees)
- "Stablecoins are sort of a solution looking for a problem" - Academic Expert*



# The Future of Stablecoin Payments is Bright

## Regulatory Landscape is Quite Mixed



### **NORTH AMERICA - UNFAVOURABLE**

- USA ranges from neutral to hostile to stablecoins, with low potential for payments adoption
- Canada is outright hostile and seeks to control stablecoin issuance and payments



### **UK & EU - FAVOURABLE**

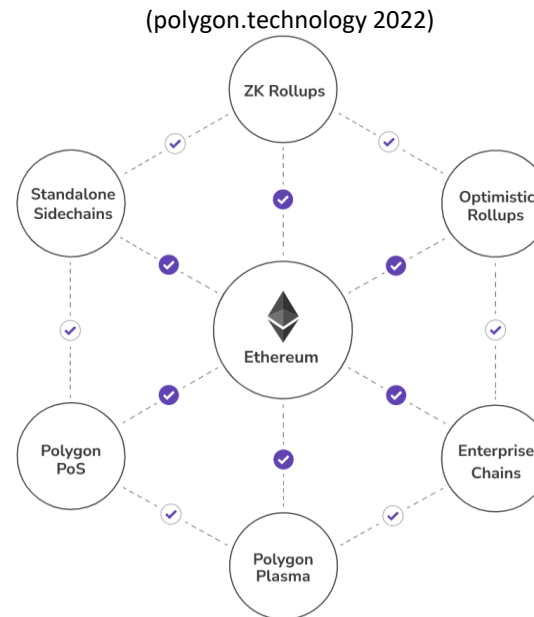
- UK and parts of EU open to treating stablecoins as essentially money
- Higher likelihood of adoption as a payments method



### **ASIA (EX CHINA) - POSITIVE TRENDS**

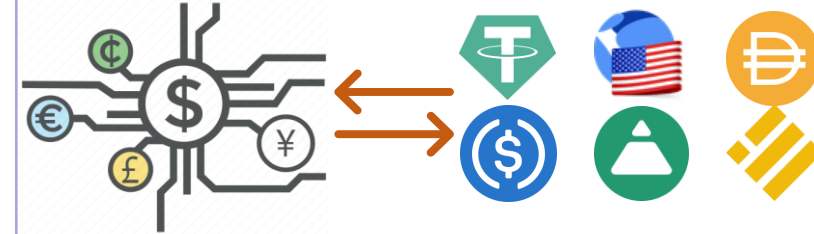
- **Virtually NO market potential for private stablecoins in China**
- Japan and Singapore show significant market potential for payments

## Technology is NOT an Obstacle



- Current limitations of speed and scalability are *ALREADY* being addressed through Layer 2 solutions and newer, faster blockchains
- Bridging technologies allow for rapid execution of stablecoin transactions on multiple blockchains
- **Technology will ENABLE, NOT BLOCK stablecoin payments in the near future**

## CBDCs and Stablecoins CAN Coexist\*



- \*Countries that launch **Pure CBDCs** will have little to no room for private coins
- However, pure CBDCs are highly impractical at present and very difficult to implement
- Both interviews and source research indicate that most countries will use *hybrid or synthetic* models
- Such CBDCs have plenty of room for payment processing networks
- Strong desire among crypto users for anonymity and privacy -> demand for private stablecoins will always exist



## 6. Use Cases

- Cross-border payments
- Online retail
- Rapid ACH payments
- Proprietary blockchain-based payments processing
- Online gaming
- Airline payments
- Exchange on/off-ramps



# Stablecoins Enable Low-Fee Cross-Border Payments

## How Nippon Yusen Uses Stablecoins to Pay Employee Salaries



(Source: NYK, 2021)

### Nippon Yusen Kaisha's Situation

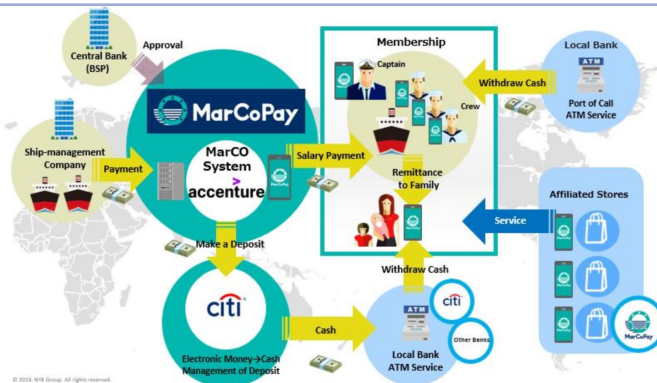
- Largest shipping company in Japan, one of the largest in the world, with 684 vessels serving 350 ports and over 35K employees as of April 2021
- Seeks to **increase shipboard security** (est. **US\$700M** kept in cash aboard ships at sea) to avoid piracy and loss of onboard cash

### MarCoPay's Solution

- Established in 2019 as 50-50 JV between NYK, Transnational Diversified Group, with Citigroup
- Created an **e-money platform** allowing ship crew to receive salaries **and remit money to family** via USD stablecoins, sent via phone app

### The Benefit of Stablecoins

- Minimises costs and risks to NYK from physical shipboard cash
- Reduces time needed for ship captains to deal with salaries
- Provides INSTANT access to cash for sailors to remit to families via app



## Stablecoins Emerging as a Ripple Competitor

- Established in 2012, uses XRP to enable global money transfers
- 0% failure rate (vs 6% for SWIFT transfers)
- Over 300 financial institutions in 40 countries use XRP
- Available in 120 currency pairs



(Frost & Sullivan, 2021)	CB (based on SWIFT)	Ripple XRP Payments
Transaction Cost	Up to US\$50	~ 0.00028 USD
Speed/Settlement	1-5 bd	~ 4 sec
Transactions Per Second (TPS) & Availability	1,700 TPS, business hours only	1,500, 24/7
Transparency	Low	Mid/High
Settlement/FX Risks	High	Low/Mid
Network	Established	Growing

- OKCoin to partner with Stellar to allow for XBD settlements using USDC - *near-zero transaction costs and near-instant settlements* (The Stellar Development Foundation 2022)

### Current Market Gap

- Ripple is a volatile coin without easy off-ramp into fiat
- Used primarily by financial institutions, not accessible to outsiders

### Proposed Stablecoin Solution

- Stellar's low-fee, high-speed, scalable network to partner with USDC to offer cross-border settlements to ordinary customers

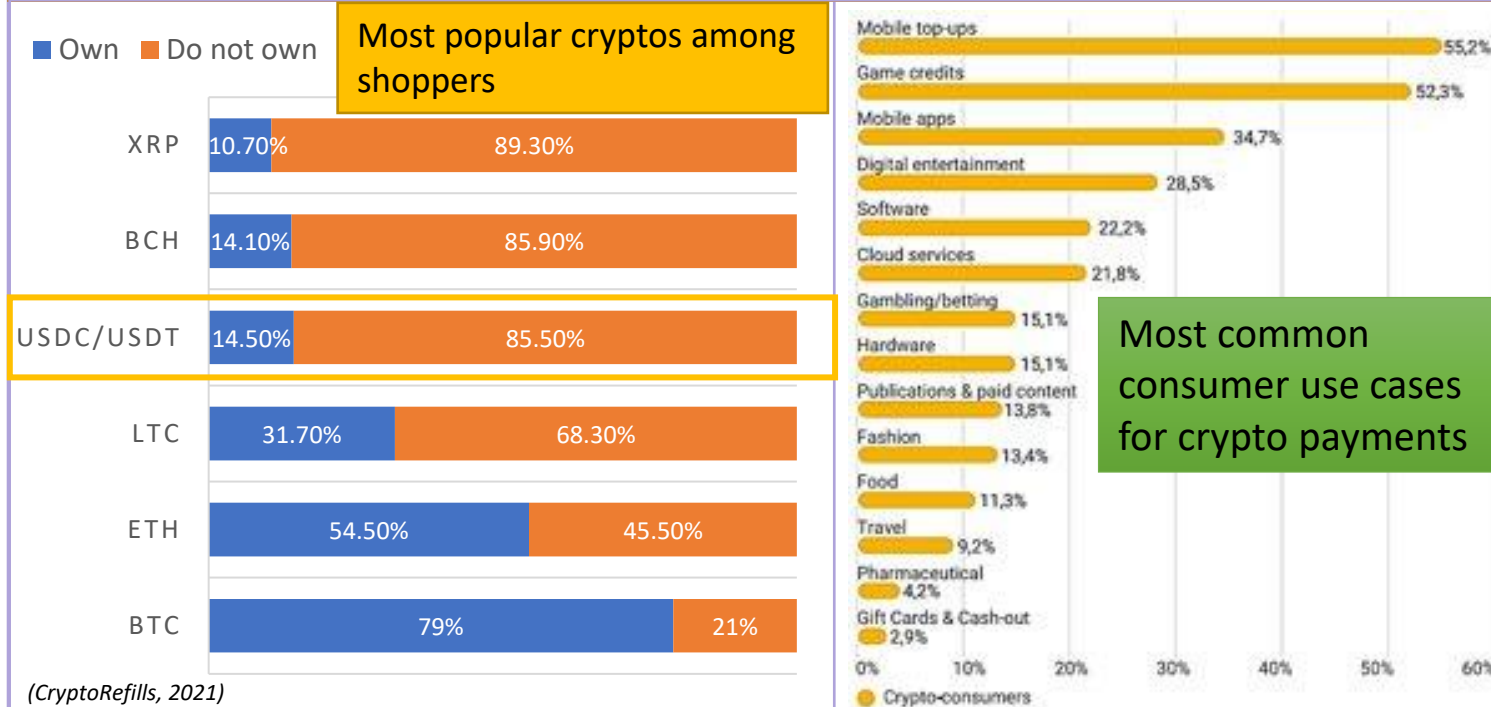
### Benefit of Stablecoins

- Stellar network offers extremely fast USDC settlements and global access to regular customers
- Partnership provides access to USDC for **US-based clients for the first time**

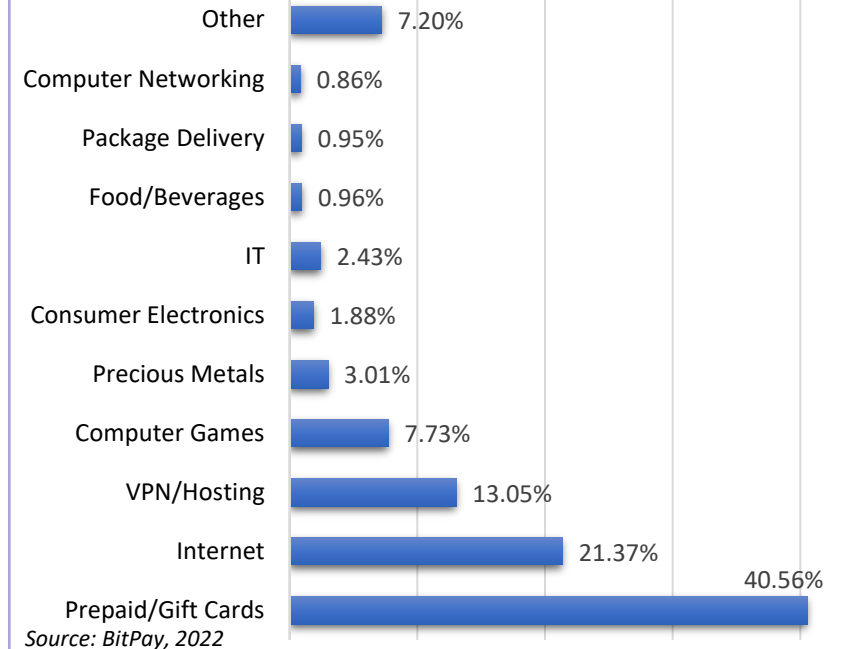


## Consumers are Increasingly Willing and Able to Pay with Stablecoins

### Stablecoins Gaining Acceptance Across Broad Range of Payment Use Cases



### BitPay Data Show Significant Interest in Stablecoins



### Demographics of Adopters



- 25-34yo feel most secure using cryptocurrency
- 83.6% of all respondents have heard of cryptocurrency
- Only 25.4% have heard of stablecoins

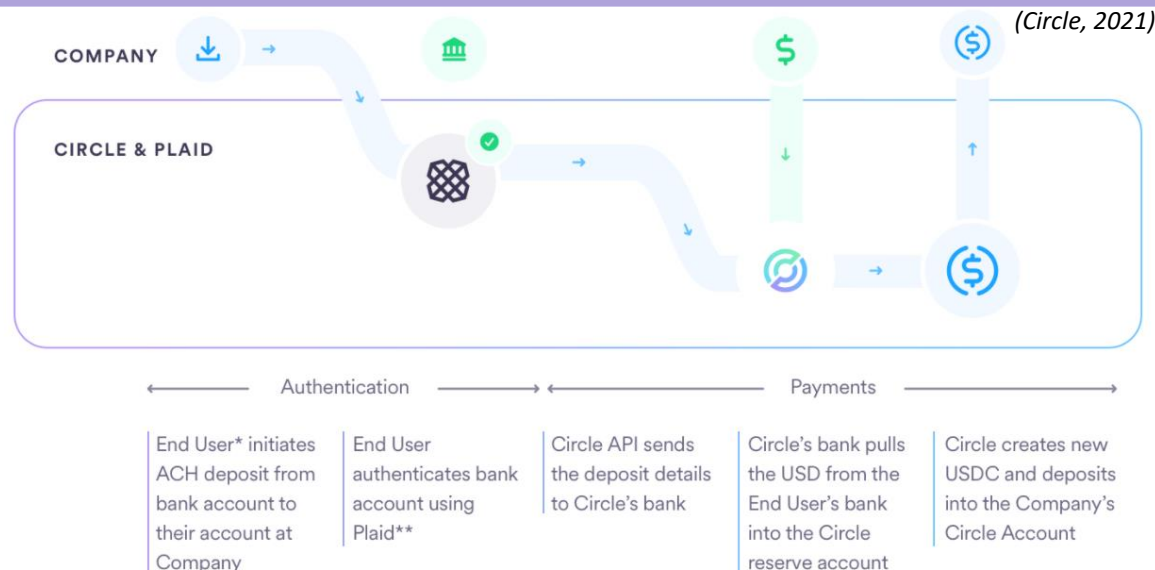
(Wirex Team 2020)

- Fiat-backed USD stablecoins accounted for nearly 2,000 transactions in January 2022 alone (66,196 transactions)
- USDC – 1,773 transactions (2.60%)
- BUSD – 112 transactions (0.17%)



## Stablecoin ACH and Point-of-Sale Use Cases Indicate Partnership Opportunities

### The Plaid-Circle Partnership



#### Current Market Gap

- Retail & individual customers cannot easily make automated payments using stablecoins due to AML/KYC requirements

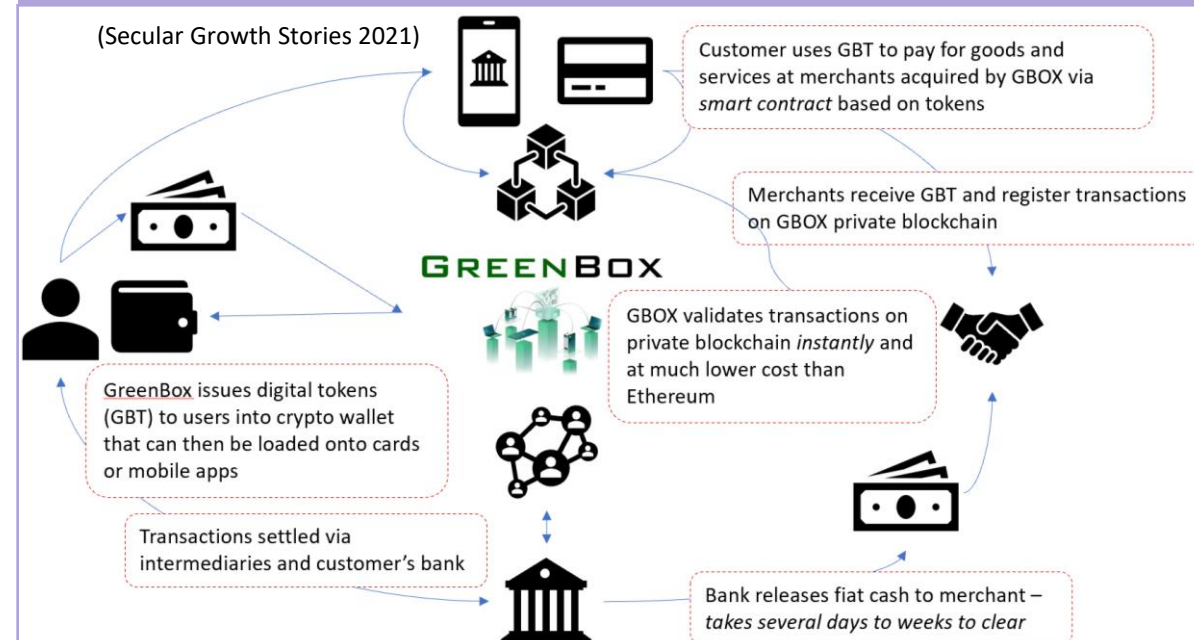
#### Proposed Solution

- Plaid to partner with Circle to enable rapid automated payments and settlements for customers

#### Partnership Benefit

- Customers experience seamless payments with stablecoins via reputable issuer
- USDC gains rapid acceptance with Plaid customers

### The GreenBox POS Situation



#### Current Market Gap

- Merchants with high risk of chargebacks cannot easily process payments on mainstream networks

#### Proposed Solution

- GreenBox POS uses proprietary blockchain and token to process reversible payments between customers and merchants in closed loop
- GBOX seeks to create and issue its own stablecoin to speed up cash settlement

#### Benefit of Stablecoins

- Extremely low transaction fees for merchants & customers relative to other methods and Ethereum
- Instant transaction settlements via GreenBox Token (GBT)
- Future GreenBox stablecoin will allow for rapid cash settlement

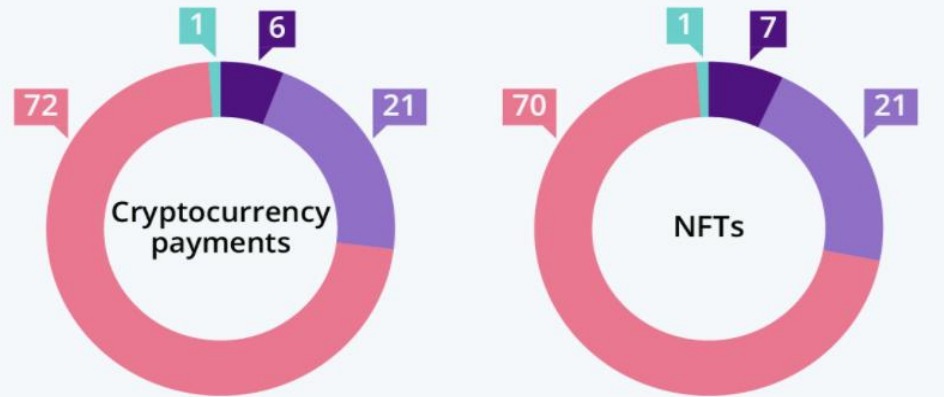


## Online Gaming is at the Forefront of Stablecoin Payments

### Game Devs Gaining Interest in Crypto Payments

#### Game Developers Interested in Implementing Crypto Payments and NFTs (in %)\* (as of 2021)

● Very interested    ● Somewhat interested  
 ● Not interested    ● Already in use



Based on survey of 2700 game developers; 2021

\*Difference to 100% due to rounding

Source: Zandt, 2022

### Why Stablecoins Matter to Game Devs

- Stablecoins provide opportunities for:
  - In-game currency monetisation
  - Building in-game payment infrastructures
  - New revenue streams for gamers and devs
- 28% of active Ethereum dAPPs were actually gaming apps in 2020 (Circle.com 2021)

### DAI Payments Power the *Axie Infinity* Universe



Released in 2018 by Vietnamese studio Sky Mavis

Digital pet universe with a player-owned economy facilitated by blockchain technology. In Axie universe, players can battle, raise, collect, and breed fantasy creatures called Axies



- US\$3.6B traded via in-house marketplace, 2.8M active daily players, most expensive Axie ever sold for US\$820K (Axieinfinity.com, 2022)
- World's second largest NFT marketplace (Statista, 2021)
- Most transactions are around US\$1K and first 100 transactions are free (Thurman, 2022)
- DAI stablecoin can be used to make purchases and land sales on Axie platform** (Blog.makerdao.com, 2021)
- In Feb 2021, Axie Infinity launched Ethereum side chain with *Ronin* to improve game scalability
- Ronin side chain utilised Ramp network to permit users to load Axie wallet with fiat converted to cryptocurrency
- Issues own cryptocurrency, **AXS**, with circulating supply of ~71M



## Airline Payments and On/Off-Ramps Provide Clear Market Opportunities

### Airlines Increasingly Accept Cryptocurrency Payments



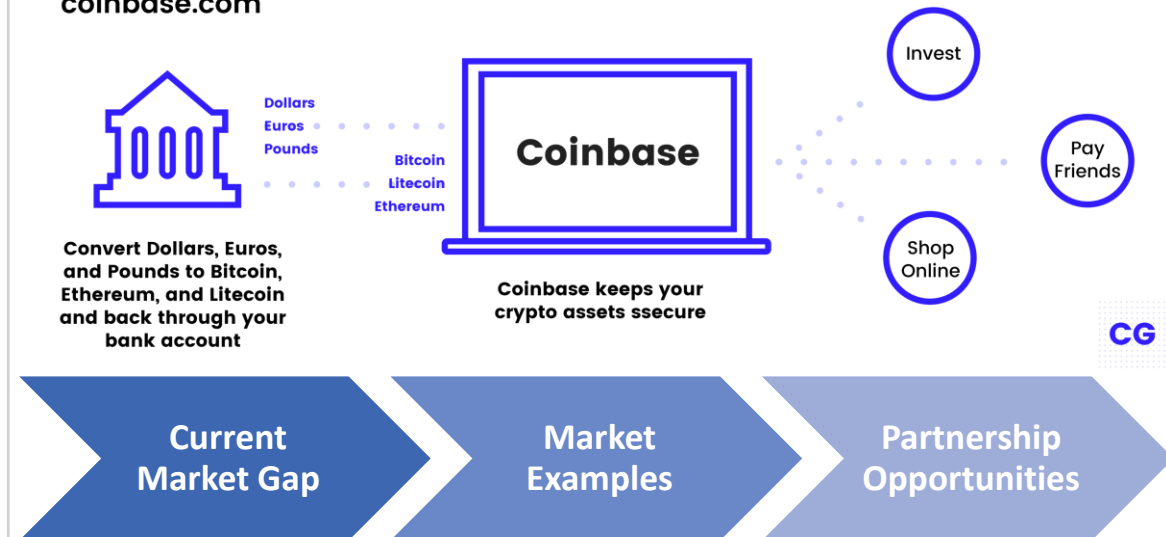
- Universal Air Travel Plan (UATP) is an airline-owned global payments network
- Announced plans in 2021 to partner with BitPay to accept cryptocurrency-based payments for bookings (Helms 2021)

- **"We process 1.5% of our revenue via cryptocurrencies. While it's not a huge number, it's one that is growing. In 2021, our annual revenue was £28m, so £400,000 per year is from cryptocurrency."** -- Digital Marketing Executive, Alternative Airlines (DeLuca 2022)
- AirBaltic now accepts GUSD, PAX, USDC, BUSD for bookings (airBaltic 2021)

### Stablecoin On/Off-Ramps

#### The Easiest On-Ramp to the Crypto World coinbase.com

(Munoz 2017)



- Crypto on/off-ramps provide customers with ability to convert from and to fiat (Blockchain Arena 2020)
- Strong need for AML/KYC authentication & onboarding
- Payment processor Simplex partnered with MakerDAO to create fully regulated on-ramp for DAI users (Zmudzinski 2020)
- Provides seamless payments via Simplex network
- Partner directly with stablecoin issuers to provide authentication services for customer card issuers and merchant acquirers to facilitate payments



## Returning to the Business Situation



### THE CORE QUESTION

*Does consumer demand exist to drive the adoption of accepting **stablecoins** as a method of payment?*

### Summary of Market Landscape



**Expert View on SaaPM Viability**  
***Not at present*** - but it is only a matter of time (1-3yrs)



**Existing Survey Data**  
***Rapidly increasing interest*** in stablecoins for payments



**Available Market Research**  
Stablecoins can succeed as a payment method IF:

- Used for larger transactions ( $\geq$  US\$1,000)
- Provably lower in fees than existing methods
- **User experience is truly *seamless***
- Stablecoins are not taxed

### Answers to Ancillary Questions

#### Dominant **CURRENT** Stablecoin Use Cases

- Crypto hedging & profit preservation
- Cross-border remittances
- Smart contract payouts

#### Stablecoin-Accessible Products & Services

- Crypto-linked cards can already pay for everyday transactions
- Frequent travellers are willing to, and interested in, using crypto (Incl. stablecoins) for bookings
- Amazon, Uber, and other online merchants already accept crypto payments **in some jurisdictions and for some services**
- Market participants are already accepting and processing stablecoin-based payments for goods and services

#### Incentives for Usage

- **Rapid settlements, very low failure rates, and very low fees for international remittances**
- **Security, anonymity, and portability for retail and online purchases**

#### B2B Use Cases

- Stablecoins can be used as a *stable* alternative to Ripple for fund transfers between banks
- Nippon Yusen use case shows that stablecoins can be used for B2B2C cases
- Stablecoins already function as collateral for DeFi lending (Wouters 2021)

#### Blockers to Adoption

- Regulatory: legal regimes concerning stablecoins are unfavourable in N. American and some European markets
- Technological: current popular stablecoins rely on slow and non-scalable technology



# PART II: CONSUMER & MERCHANT VIEWS OF SAAPM



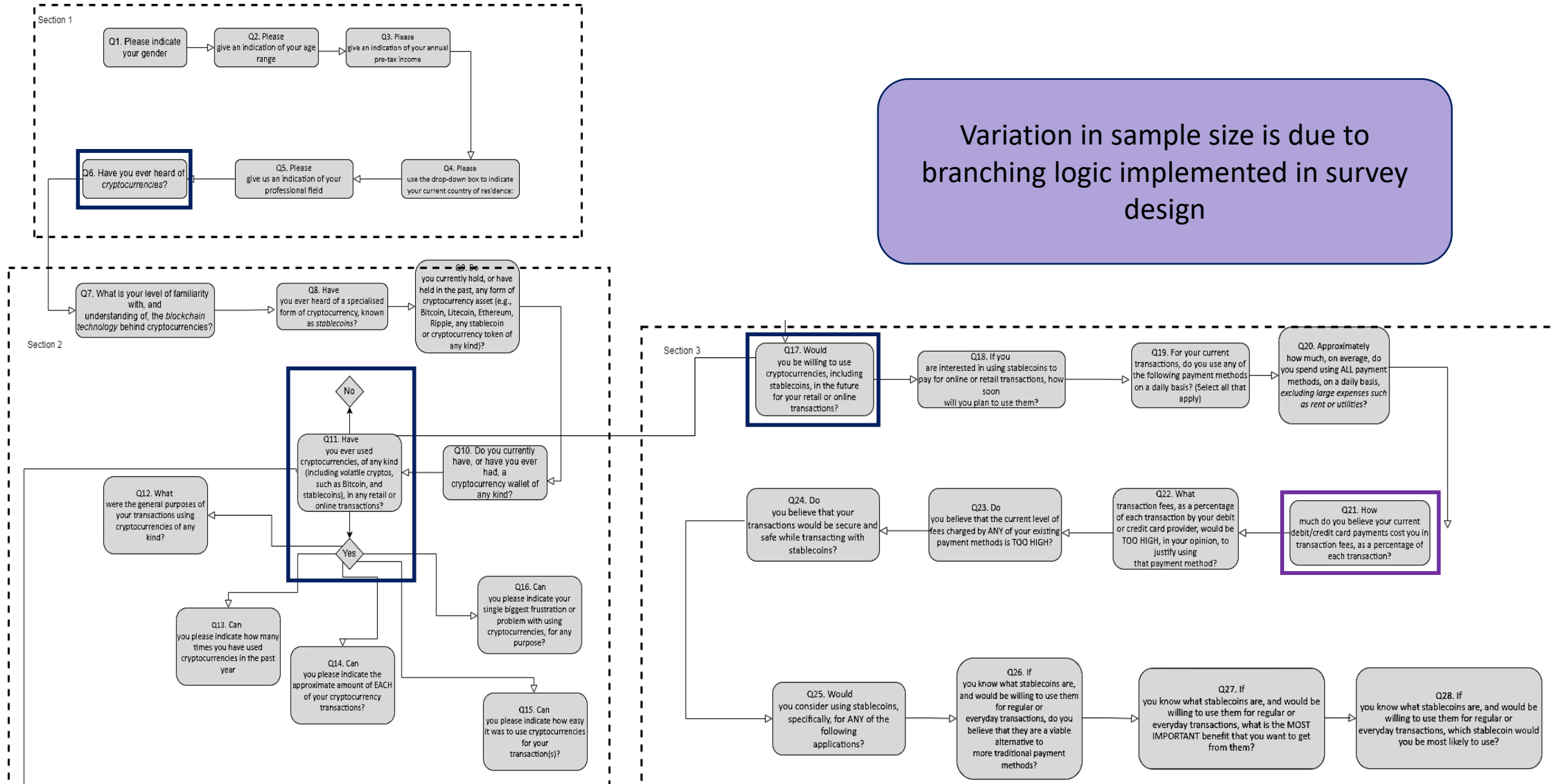
# 7. Survey Results – Qualtrics

- Initial broad-spectrum consumer sentiment survey results



## Consumer Sentiments – Survey Design

Variation in sample size is due to branching logic implemented in survey design

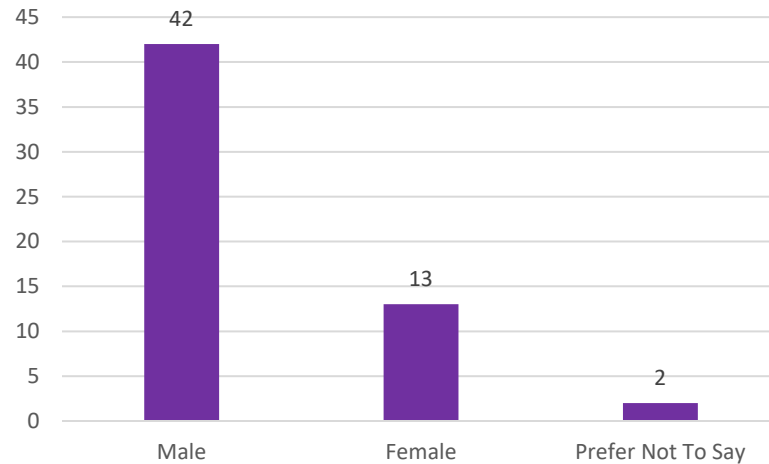




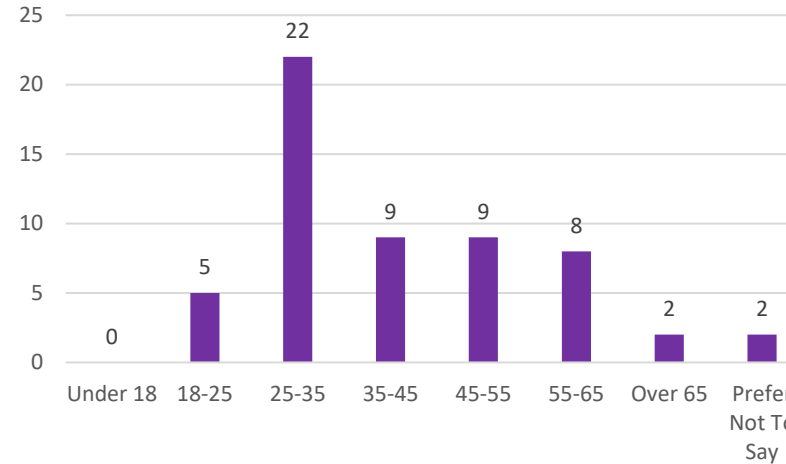
## Consumer Sentiments

### Customer Survey - Qualtrics

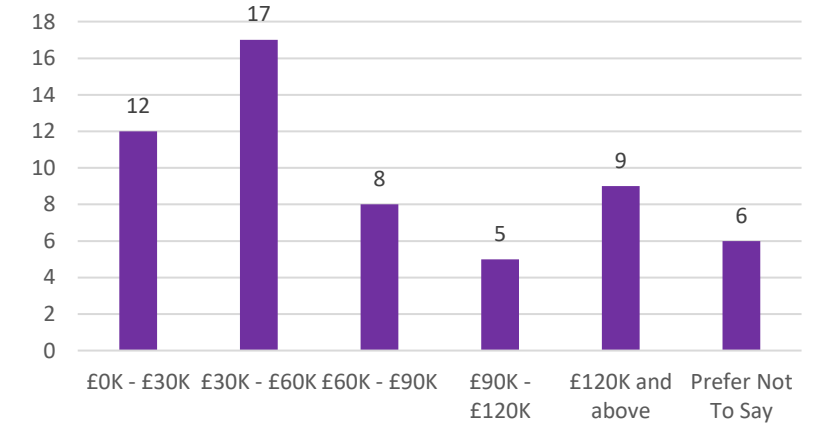
Please indicate your gender



Please give an indication of your age range



Please give an indication of your pre-tax income, in GBP



- Our respondents skewed toward the Millennial generation, with incomes in the lower to middle class range
- We distributed our survey through LinkedIn and other professional and social networks
- Therefore, **our sample is biased** toward those who will have a higher level of knowledge of cryptocurrencies than average

Sample Size

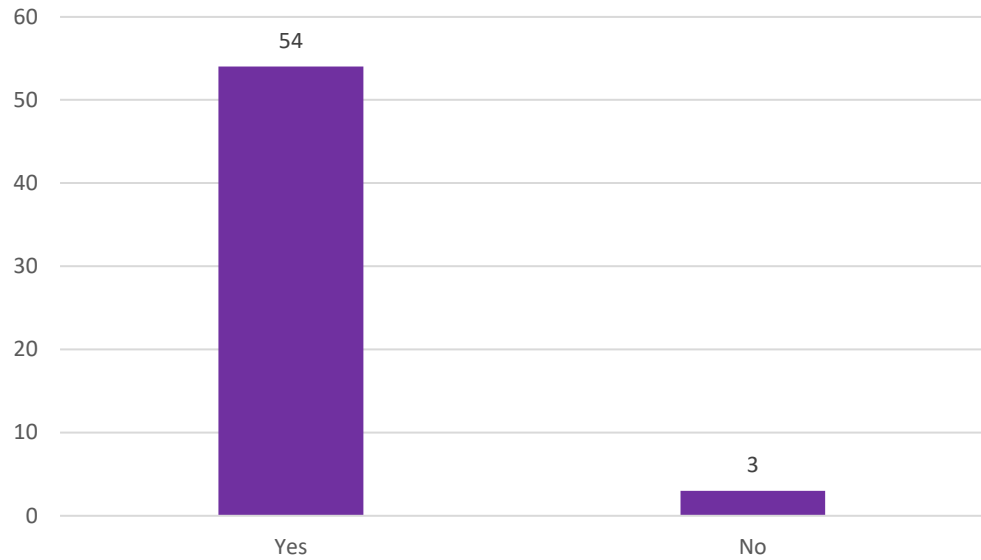
57



## Consumer Sentiments

### Customer Survey - Qualtrics

Have you ever heard of cryptocurrencies (including stablecoins of any kind)?

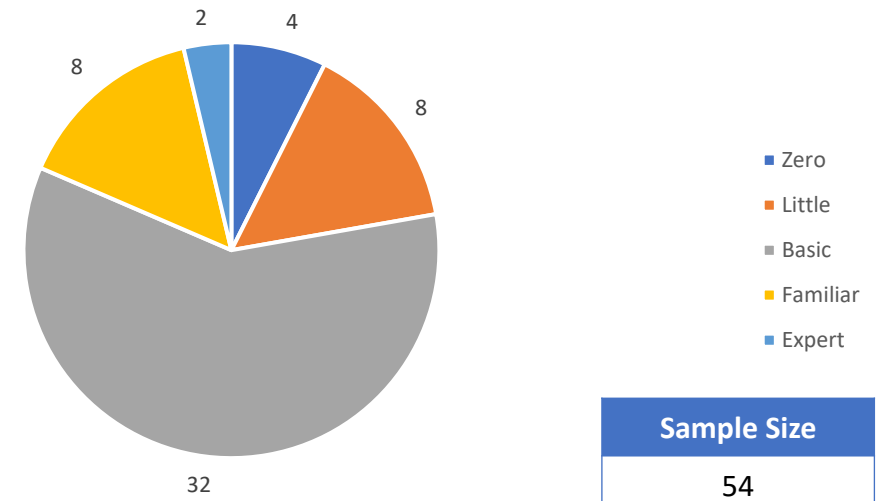


Sample Size

57

- 94.7% (54 responses) indicated that they had heard of cryptocurrencies of any kind, including stablecoins

What is your level of familiarity with, and understanding of, the blockchain technology behind cryptocurrencies, including stablecoins?



Sample Size

54

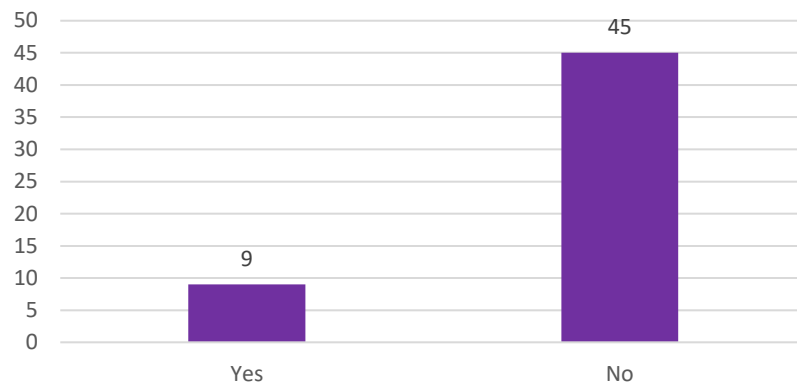
- Of the respondents who had heard of cryptocurrencies (54 respondents) to indicate their level of familiarity with the blockchain technology, 78% (42 respondents) of respondents have at least a basic level of understanding of blockchain technology.



## Consumer Sentiments

### Customer Survey - Qualtrics

Have you ever used cryptocurrencies, of any kind in any retail or online transactions?



Sample Size

54

- Of the respondents who had heard of cryptocurrencies (54 respondents), only 17% (9 respondents) of respondents had ever used cryptocurrencies.

What were the general purposes of your transactions using cryptocurrencies, including stablecoins? Please select ALL that apply:



Sample Size (Respondents)

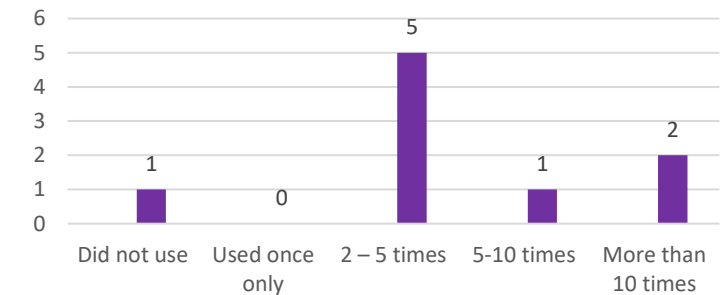
9

Number of responses  
(Multiple answers)

10

- A sample size of 9 is too small to draw inferences of any reliable sort.
- Present this data for illustrative purposes only

How many times you have used cryptocurrencies, including stablecoins, of any kind, to the best of your recollection, in the past 12 months?



Sample Size

9

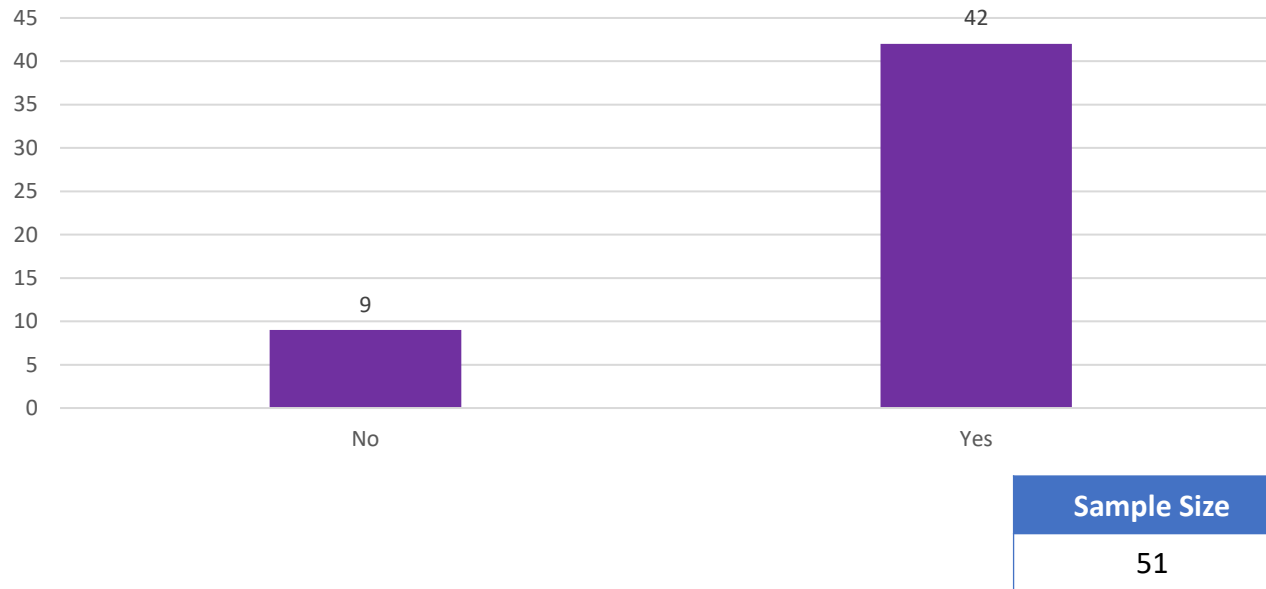
- 89% (8 respondents) had used cryptocurrencies 2 or more times in the past 12 months



## Consumer Sentiments

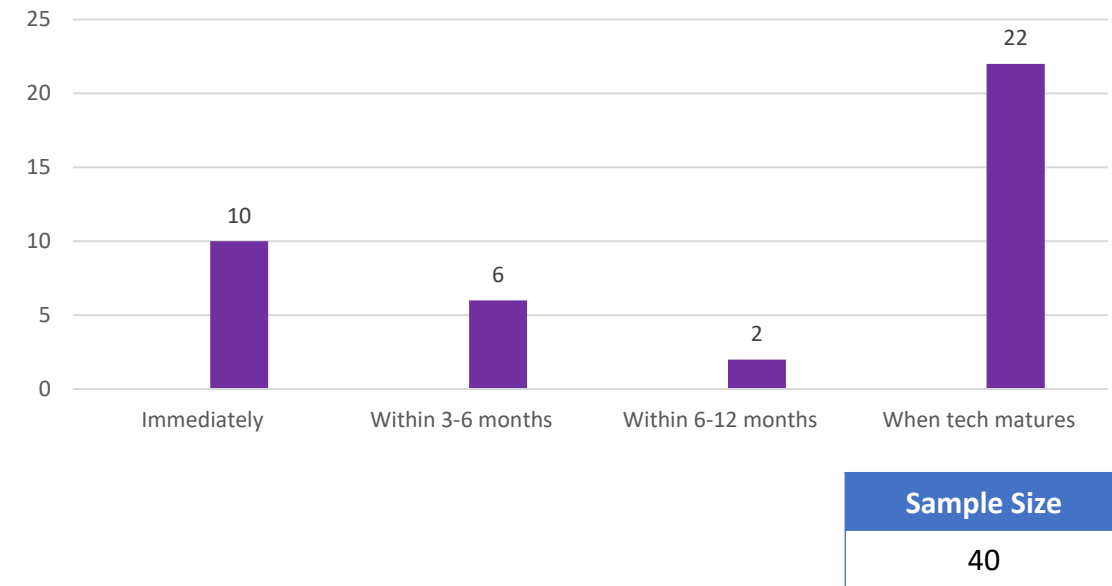
### Customer Survey - Qualtrics

Would you be willing to use stablecoins, specifically, in the future for your retail or online transactions?



- This is the key part of the survey.
- Of 51 respondents, 83% (42 respondents) stated that they would be interested in using stablecoins in the future.

How soon would you be willing to use stablecoins for online and retail transactions?



- Of the 40 responses who are interested in using stablecoins in the future, over 50% (22 responses) want to wait until the technology matures.
- It seems that they have no fixed timelines for adoption.

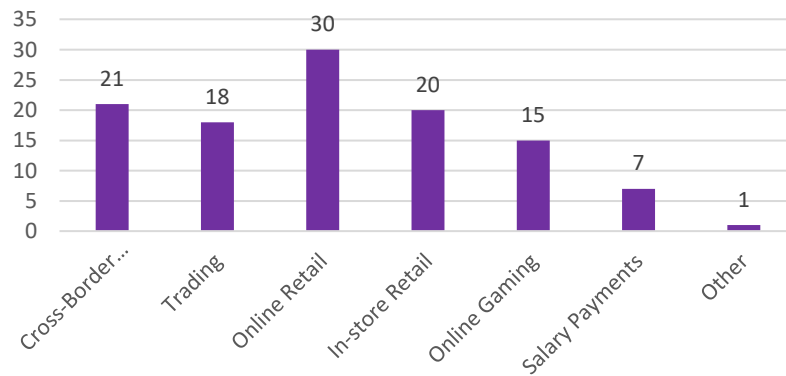


# Consumer Sentiments



## Customer Survey - Qualtrics

Would you consider using stablecoins, specifically, for ANY of the following applications?



Sample Size (Respondents)

Number of responses  
(Multiple answers)

40

112

- Asked 40 respondents who are interested in using stablecoins in the future about use cases.
- Beyond trading and hedging, online retail dominated potential use cases, followed by cross-border payments, in-store retail, and online gaming.

What is the MOST IMPORTANT potential benefit to you of using stablecoins?

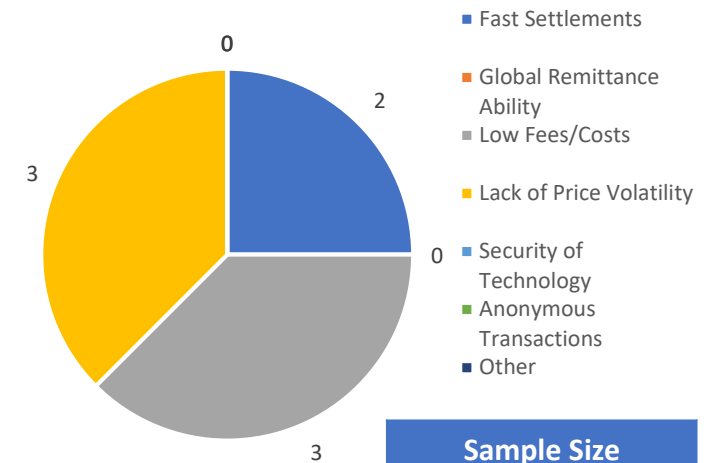


Sample Size

40

- The key benefit of stablecoins, for those who are interested in using it for payments, is lower transaction costs
- Potential users also rate security highly as a key benefit

Which ONE attribute of stablecoins, specifically, is most important to you when using them as a payment method?



Sample Size

8

- Of the 8 who had used cryptocurrencies, 25% (2 respondents) thinks 'fast settlement' is benefit of using it. 37.5% (3 respondents) and 37.5% cited 'low cost' and 'low volatility' as advantages respectively.
- **A sample size of 8 is too small to draw inferences of any reliable sort.**

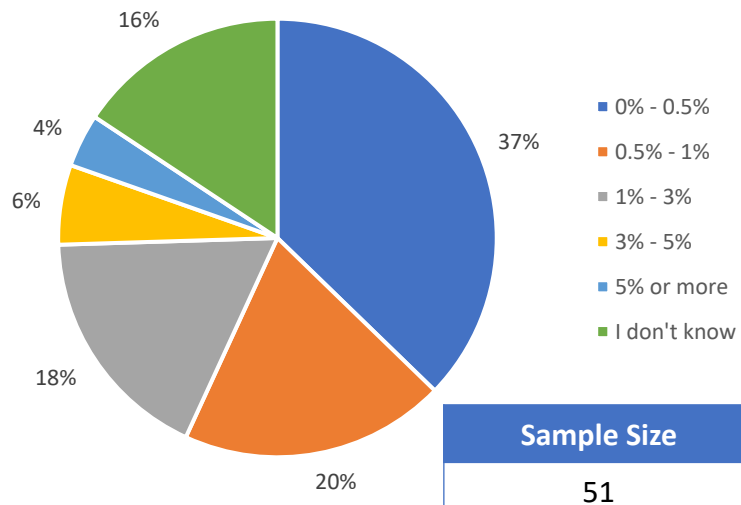


# Consumer Sentiments



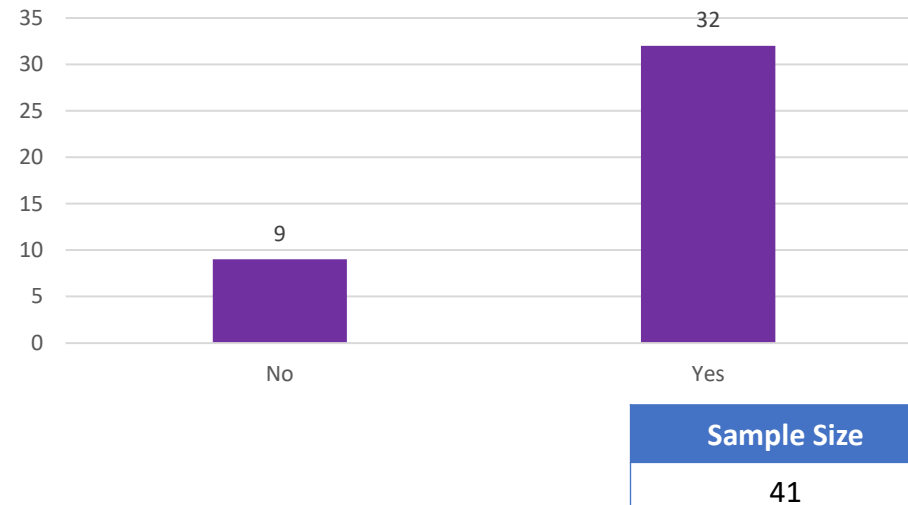
## Customer Survey - Qualtrics

How much do you believe your current debit or credit card payments cost you in terms of transaction fees, on average, as a percentage of each transaction?



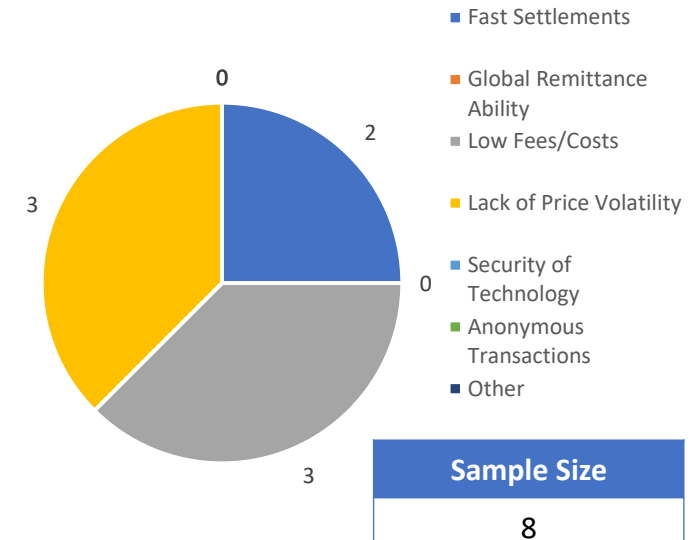
- 37% evaluated their current cost of using credit/debit cards at between 0 and 50bps
- Over 50% evaluated it less than 1%

If you could use stablecoins as a payment method, do you believe that your transactions would be secure and safe?



- Asked 41 respondents who are interested in using stablecoins in the future about use cases.
- 78% (32 responses) stated stablecoin transactions would be safe and secure.

Which ONE attribute of stablecoins, specifically, is most important to you when using them as a payment method?



- Lack of price volatility is the most important attribute among those willing to use stablecoins for payments immediately
- **Note that a sample size of 8 is too small to draw useful inferences**



## 8. Survey Results – Survey Monkey

- Large-sample, country-specific consumer sentiment survey results

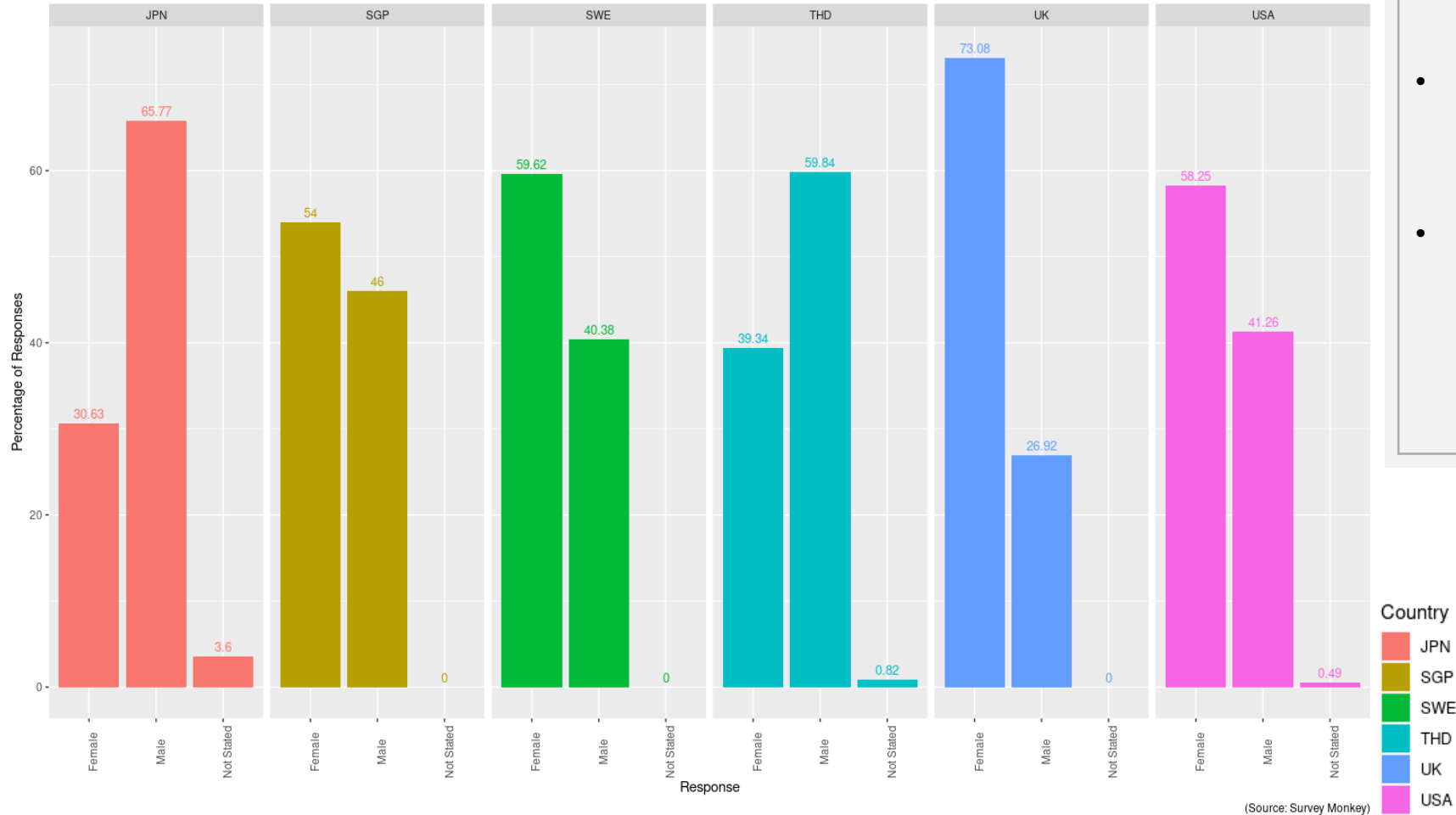


# Consumer Sentiments

## Customer Survey - Survey Monkey

Please Indicate your Gender

Percentage of Respondents - See Sample Size Table for Actual Counts



- Contrary to our Qualtrics results, the majority of respondents across our sampled countries are female, except in Japan and Thailand.
- This lends credence to the results when cross-compared with Qualtrics, as our Survey Monkey samples use a wider cross-section of society.

Country	Sample Size
Japan	111
Singapore	100
Sweden	104
Thailand	122
UK	104
USA	206

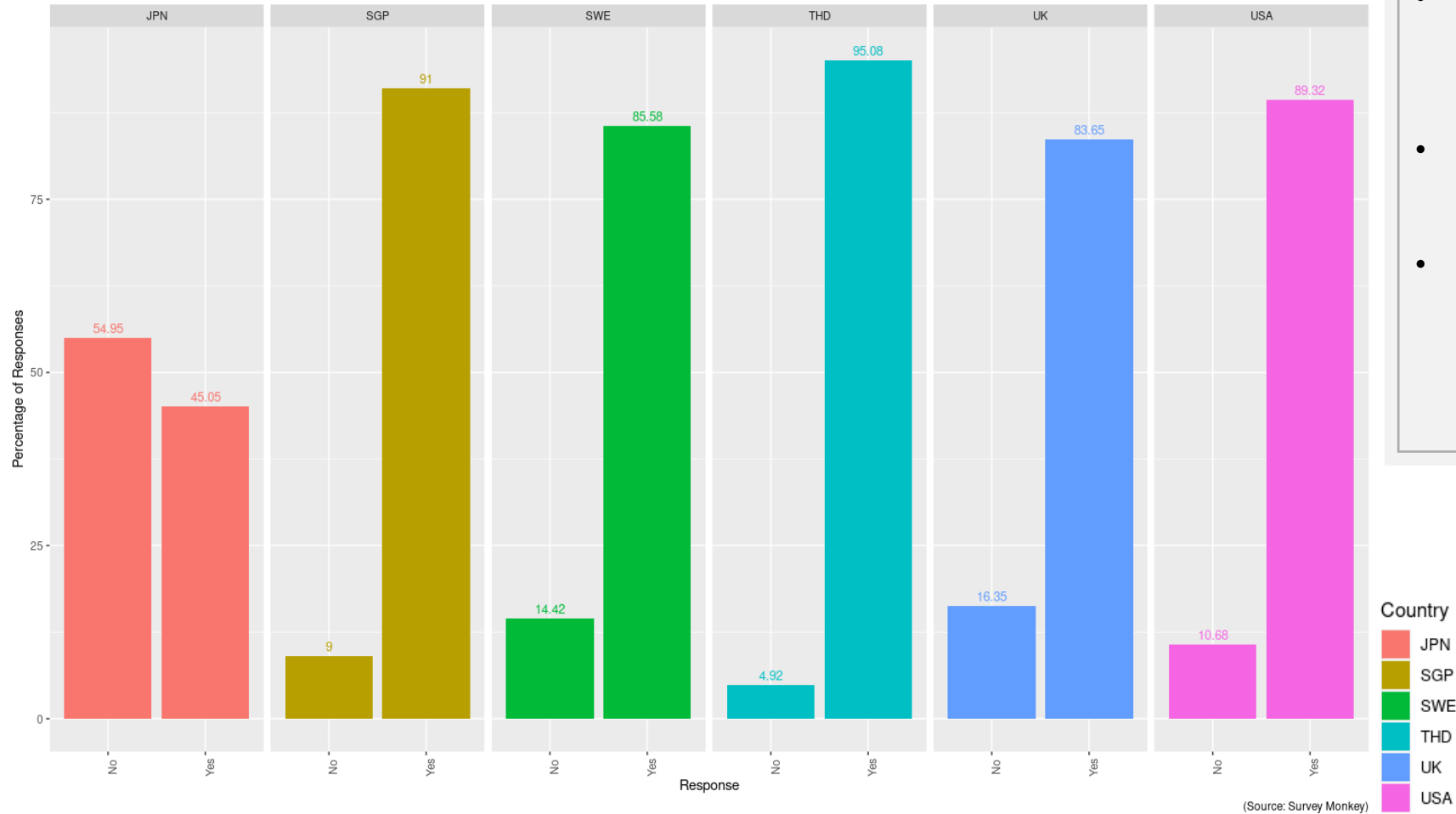


# Consumer Sentiments

## Customer Survey - Survey Monkey

Have you Ever Heard of Cryptocurrencies (Including Stablecoins of any Kind)?

Percentage of Respondents - See Sample Size Table for Actual Counts



- Awareness of cryptocurrencies in general is quite high among respondents, except in Japan.
- In all other countries, at least 83% of respondents know about cryptocurrencies,
- This results largely validates earlier findings from our expert interviews and background literature about the general level of awareness of cryptocurrencies in these countries.

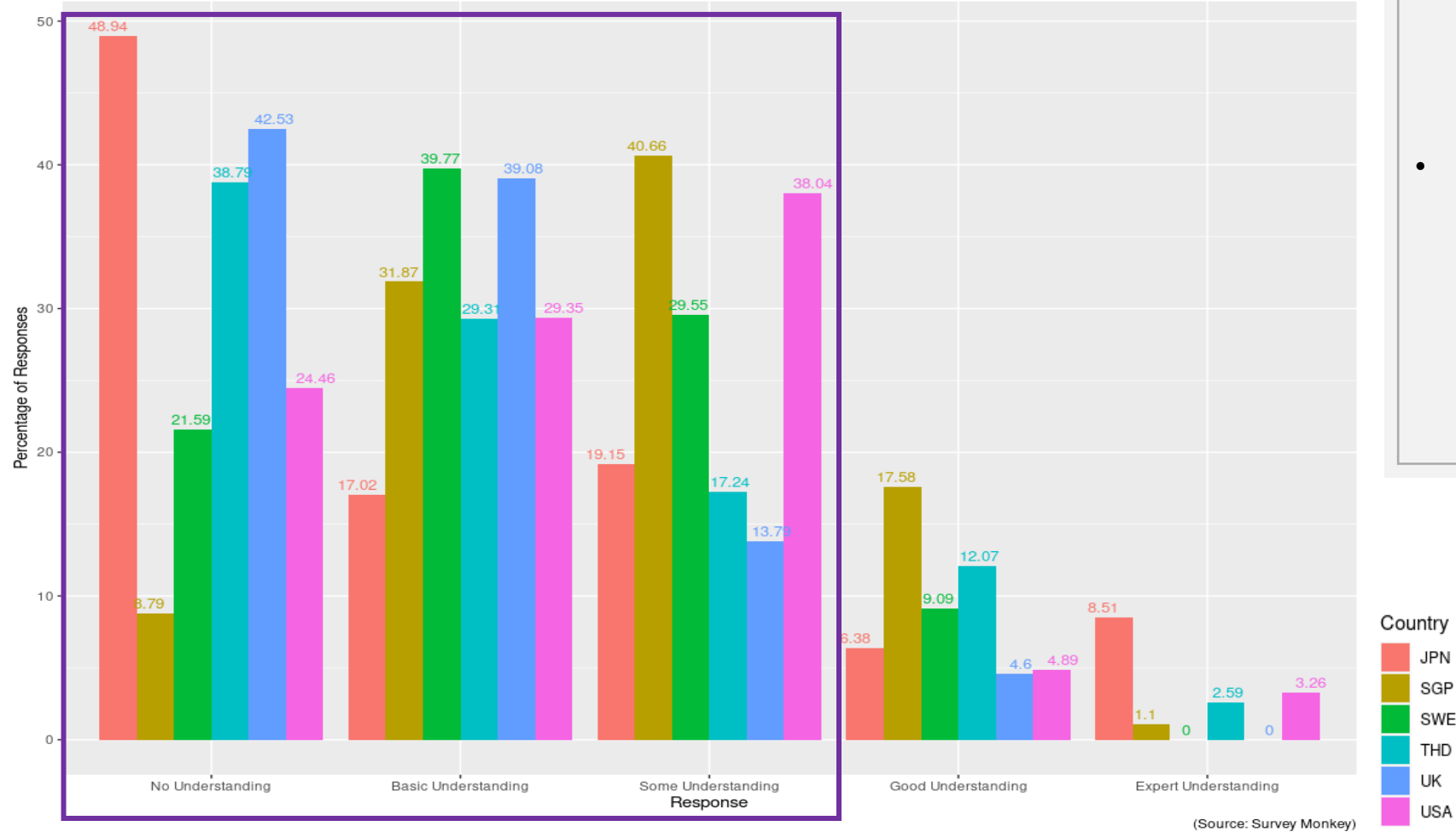
Country	Sample Size
Japan	111
Singapore	100
Sweden	104
Thailand	122
UK	104
USA	206



# Consumer Sentiments

## Customer Survey - Survey Monkey

What is your Level of Understanding of the Blockchain Technology Behind Cryptocurrencies?  
Percentage of Respondents - See Sample Size Table for Actual Counts



- Of those who have heard of cryptocurrencies in general, the majority of respondents have relatively limited understanding of blockchain technology.

Country	Sample Size
Japan	47
Singapore	91
Sweden	88
Thailand	116
UK	87
USA	184

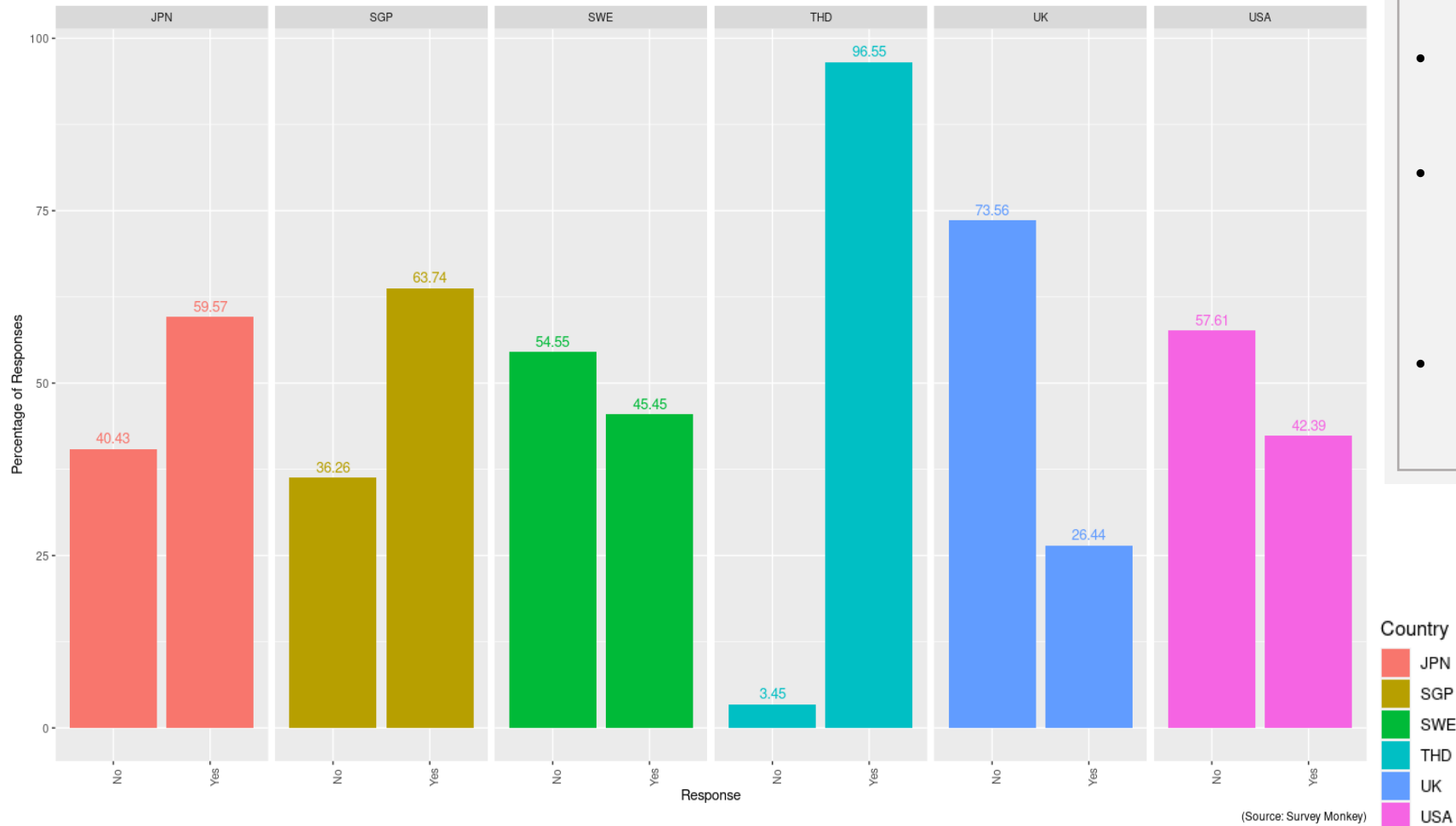


# Consumer Sentiments

## Customer Survey - Survey Monkey

Do you Currently Hold, or Have you Ever Held in the Past, any Form of Cryptocurrency Asset?

Percentage of Respondents - See Sample Size Table for Actual Counts



- Of those who know about cryptocurrencies, usage rates are generally low to moderate.
- The exception is Thailand, where it can be seen anomalously high rates of cryptocurrency usage among those who have actually heard of the concept.
- It can be seen relatively high rates of usage in Singapore.

Country	Sample Size
Japan	47
Singapore	91
Sweden	88
Thailand	116
UK	87
USA	184

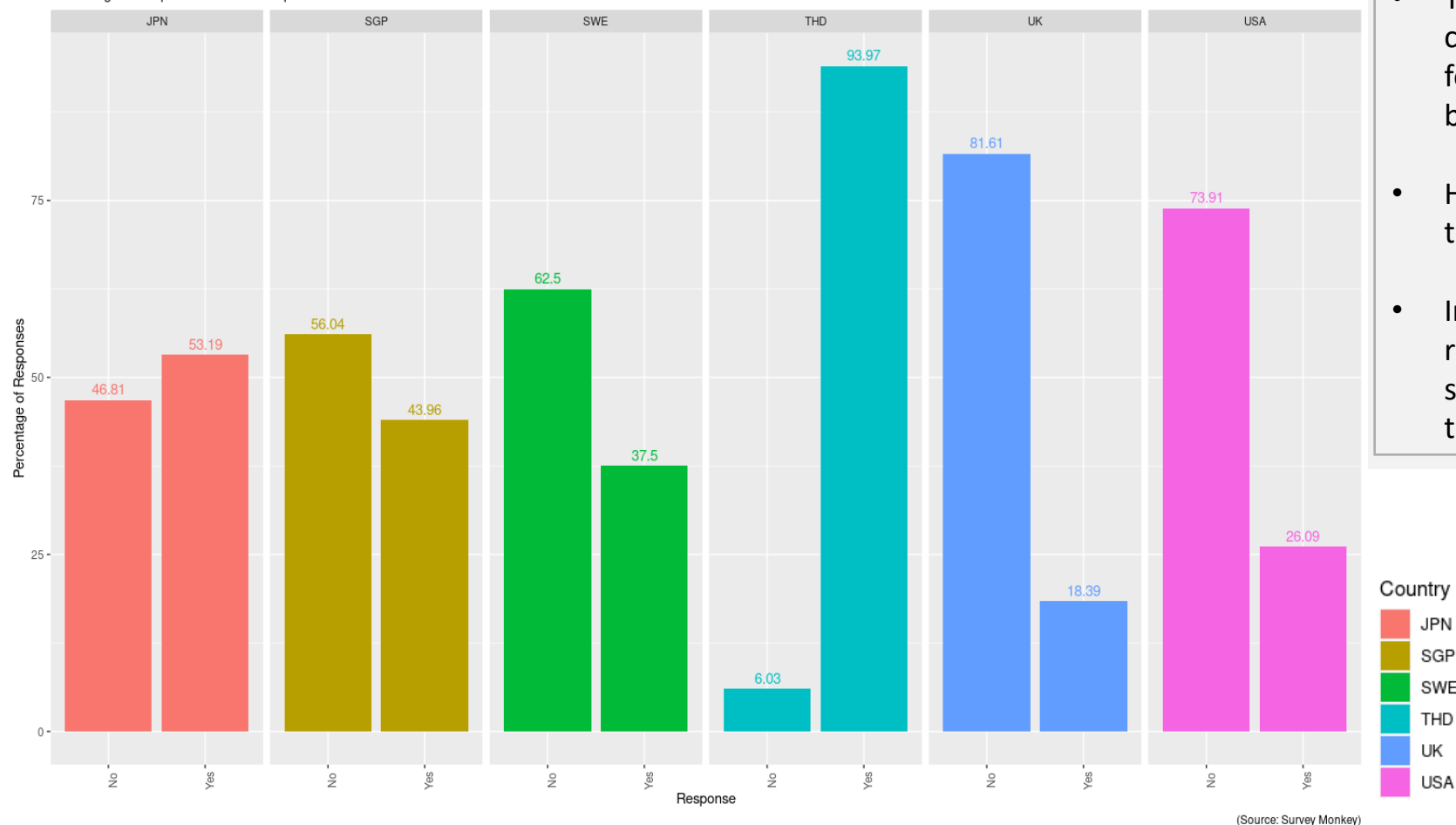


## Consumer Sentiments

### Customer Survey - Survey Monkey

Have you Ever Used Cryptocurrencies in any Retail or Online Transactions?

Percentage of Respondents - See Sample Size Table for Actual Counts



- The proportion of those who had heard of cryptocurrencies who had or had not used them for online transactions did not differ significantly between Japan, Singapore and Sweden.
- However, 94% of respondents in Thailand said that they had used it for online transactions.
- In direct contrast to Thailand, 82% and 74% of respondents in the UK and the USA, respectively, said they had never used it for online transactions.

Country	Sample Size
Japan	47
Singapore	91
Sweden	88
Thailand	116
UK	87
USA	184

\* Thailand's securities regulator announced on 23rd March 2022 that it is barring the use of cryptocurrencies (including stablecoins) for payment of goods and services from 1st April 2022. The SEC said it was taking action in order to protect the stability of the country's financial and monetary systems from threats including money laundering and other cybercrimes (*The Washington Post*, 2022; *Bank of Thailand*, 2022). This survey had closed on 11 March before the announcement.

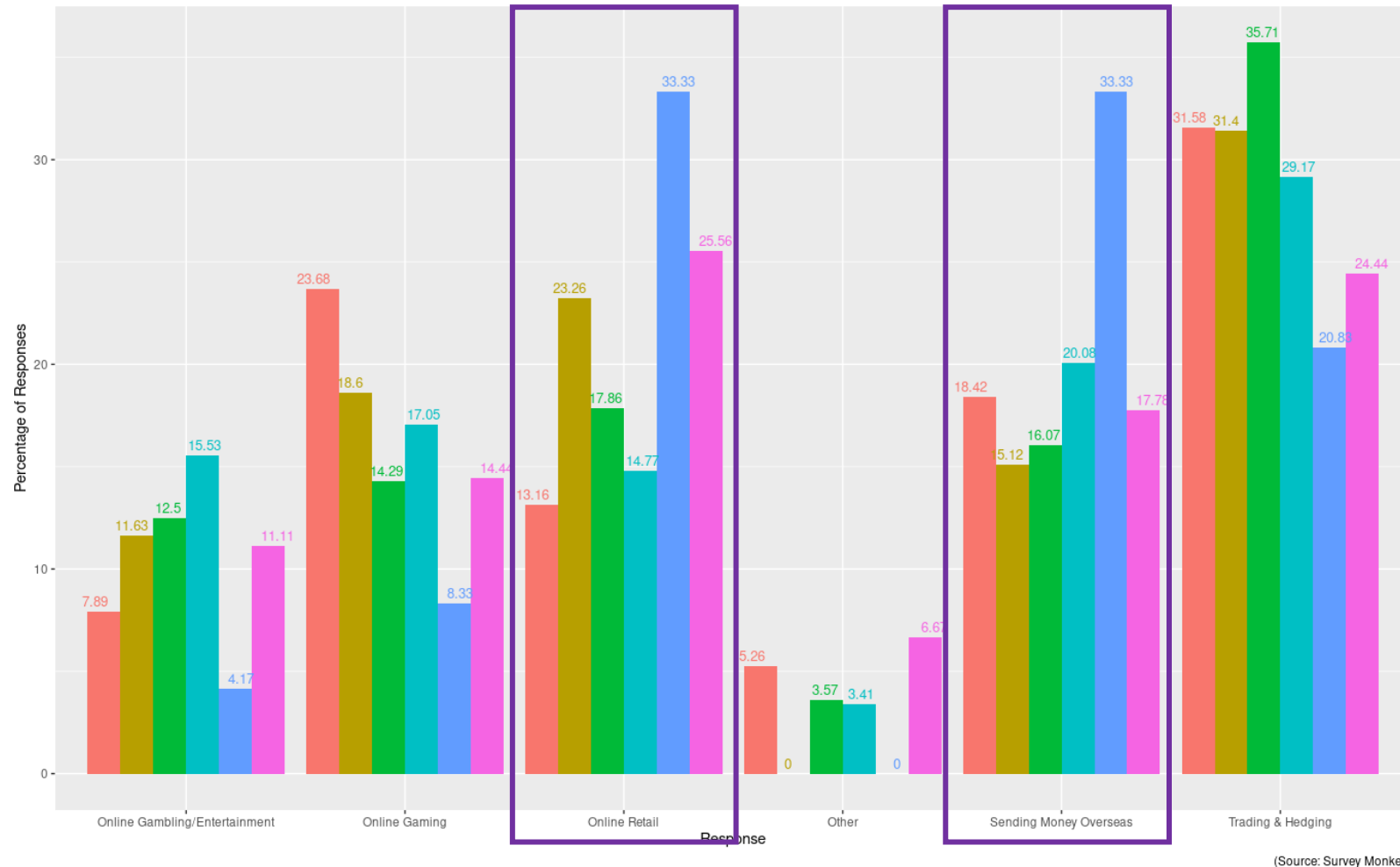


# Consumer Sentiments

## Customer Survey - Survey Monkey

What Were the General Purposes of your Transactions using Cryptocurrencies, Including Stablecoins?

Percentage of Respondents - See Sample Size Table for Actual Counts



- Outside of trading and hedging, online retail, cross-border remittances, and online gaming are the most prevalent use cases for cryptocurrency transactions.
- This is in line with our general Qualtrics results, and reaffirms the points made by our expert interviewees and by the background literature.

Country	Sample Size (Respondents)	Number of responses (Multiple answers)
Japan	25	38
Singapore	40	86
Sweden	33	56
Thailand	109	264
UK	16	24
USA	48	90

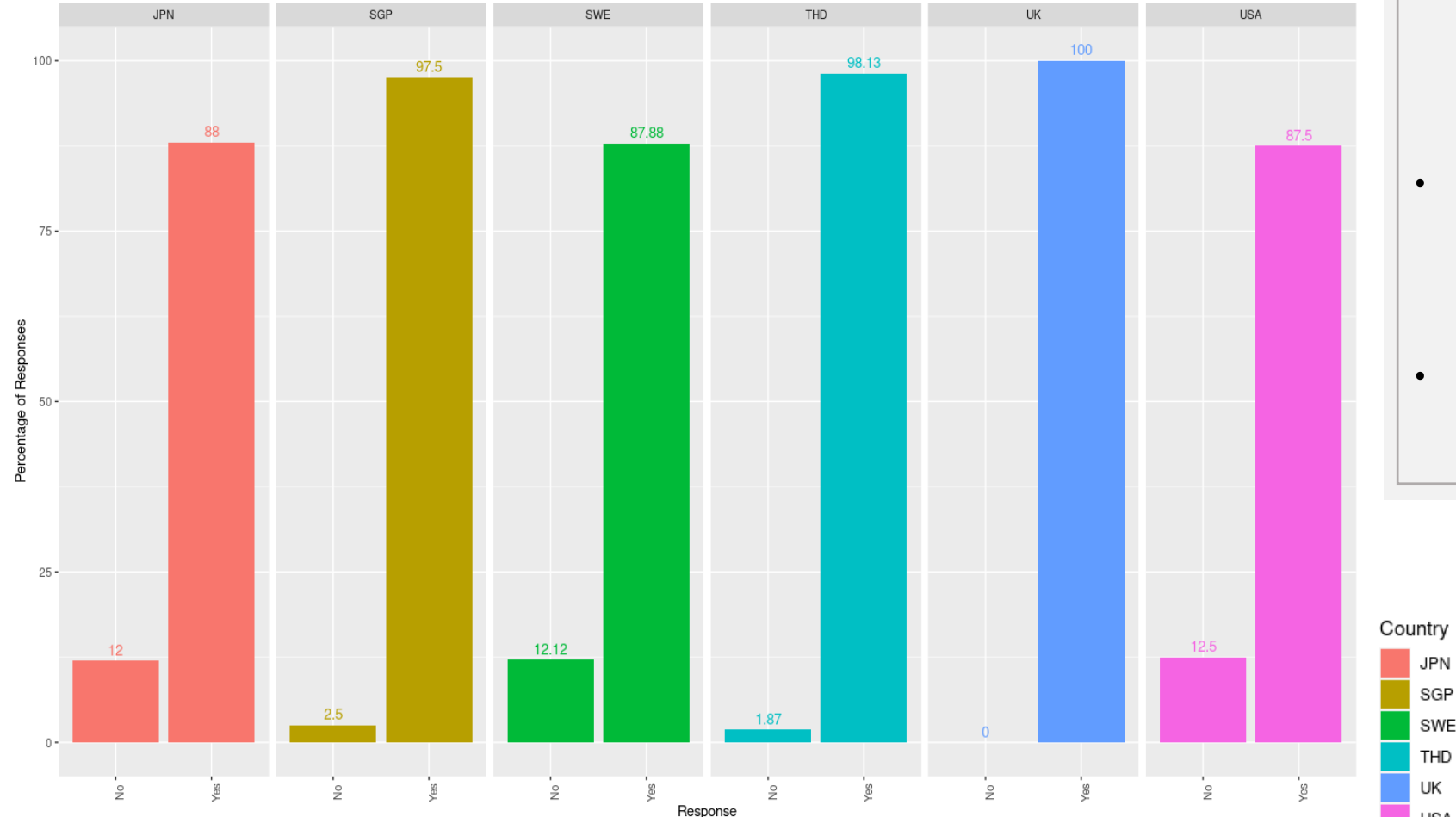


# Consumer Sentiments

## Customer Survey - Survey Monkey

Would you be Willing to Use Stablecoins, Specifically, in the Future for your Retail or Online Transactions?

Percentage of Respondents - See Sample Size Table for Actual Counts



(Source: Survey Monkey)

- When cross-referenced against the sample sizes, there is strong interest across every country surveyed, among those who have heard of cryptocurrencies, to use stablecoins.
- The sample sizes for Japan and the UK are too small to provide reliable inferences. The larger sample size for the USA, Singapore, Thailand, and Sweden provide offsets to this.
- The strength of the overall sentiment indicates that there is a real interest in using stablecoins as a payment method.

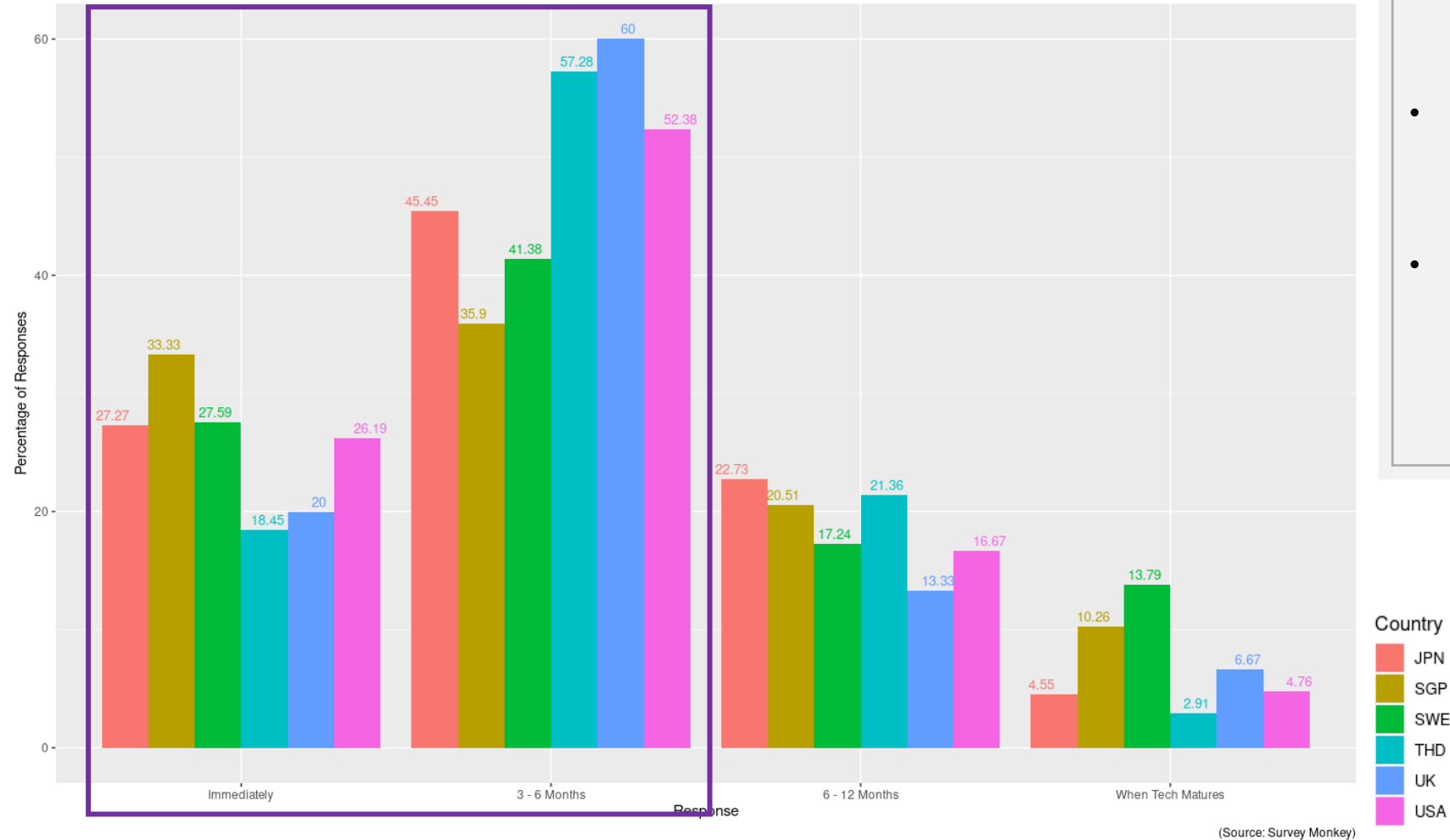
Country	Sample Size
Japan	25
Singapore	40
Sweden	33
Thailand	107
UK	16
USA	48



# Consumer Sentiments

## Customer Survey - Survey Monkey

How Soon Would you be Willing to Use Stablecoins for Online and Retail Transactions?  
Percentage of Respondents - See Sample Size Table for Actual Counts



- Most surveyed consumers are willing to adopt stablecoins as a payment method within the next 12 months.
- Although the results differ from those of Qualtrics, but this results come from larger sample sizes and are likely to be more robust.

Country	Sample Size
Japan	22
Singapore	39
Sweden	29
Thailand	103
UK	15
USA	42

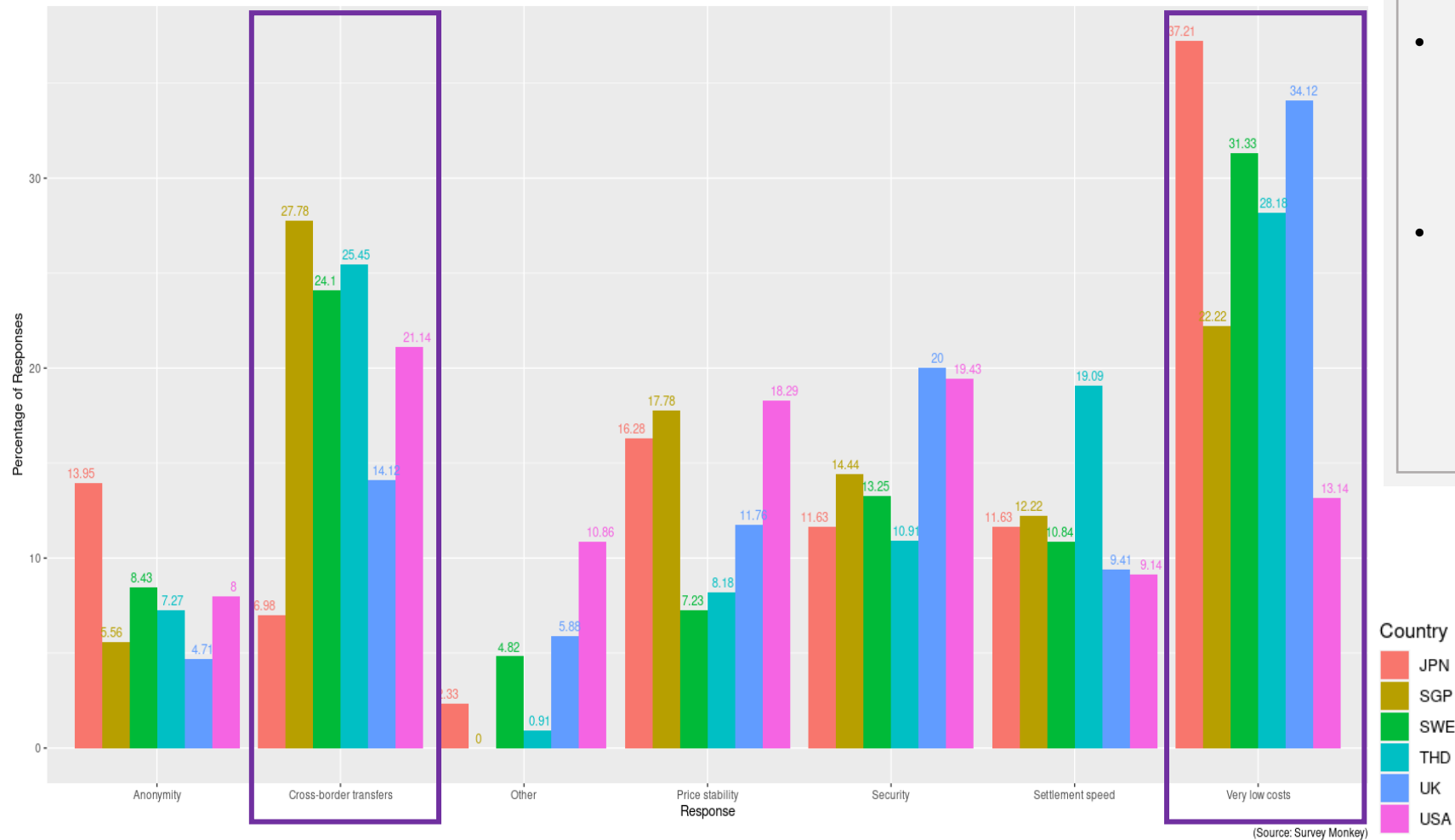


## Consumer Sentiments

### Customer Survey - Survey Monkey

Which ONE Attribute of Stablecoins, Specifically, is Most Important to you when using Them as a Payment Method?

Percentage of Responses - See Sample Size Table for Actual Counts



- The value of stablecoins lies in their cost competitiveness relative to other payment methods, the ability to send money overseas, and the security of the underlying technology.
- Low costs are most important in Japan, while cross-border transfers are most important in Singapore. US consumers do not regard the low costs of stablecoins as particularly important – security and cross-border transferability are more important.

Country	Sample Size
Japan	43
Singapore	90
Sweden	83
Thailand	110
UK	85
USA	175

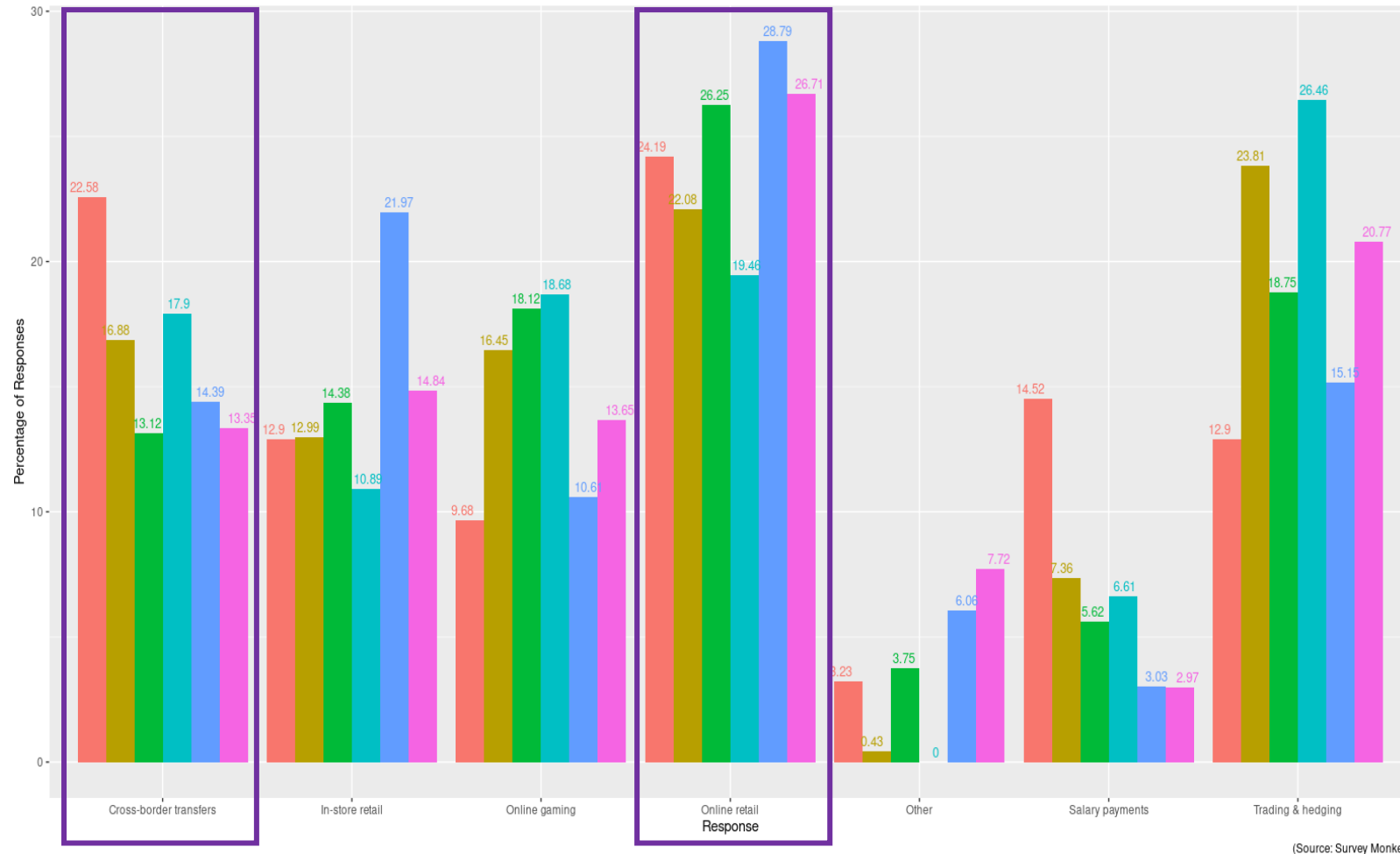


# Consumer Sentiments

## Customer Survey - Survey Monkey

Would you Consider using Stablecoins, Specifically, for ANY of the Following Applications?

Percentage of Respondents - See Sample Size Table for Actual Counts



- Outside of trading and hedging, online retail and cross-border transfers are the two most important potential use cases to consumers across countries surveyed
- Online retail is of greatest interest to UK and US consumers, while Japanese consumers value online retail and cross-border transfers almost equally.
- Online gaming is a high-interest use case for customers in Singapore, Sweden, and Thailand, but consumers in the USA, UK, and Japan are more interested in online retail.

Country	Sample Size (Respondents)	Number of responses (Multiple answers)
Japan	42	62
Singapore	90	231
Sweden	82	160
Thailand	110	257
UK	84	132
USA	175	337

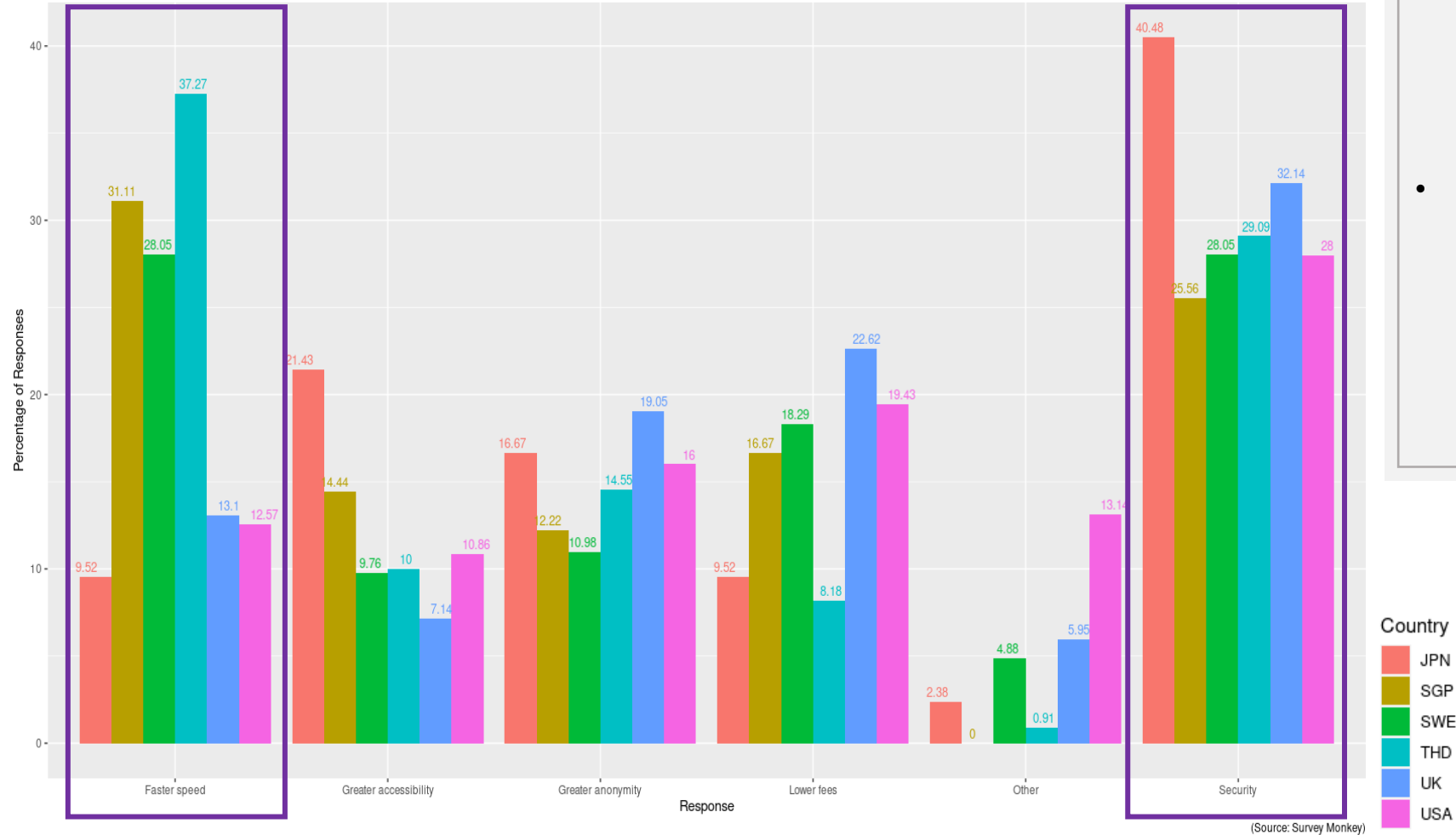


# Consumer Sentiments

## Customer Survey - Survey Monkey

What is the MOST IMPORTANT Potential Benefit to you of using Stablecoins?

Percentage of Responses - See Sample Size Table for Actual Counts



- Unlike our Qualtrics results, security and speed, not cost, are the most important attributes for consumers.

Country	Sample Size
Japan	42
Singapore	90
Sweden	82
Thailand	110
UK	84
USA	175

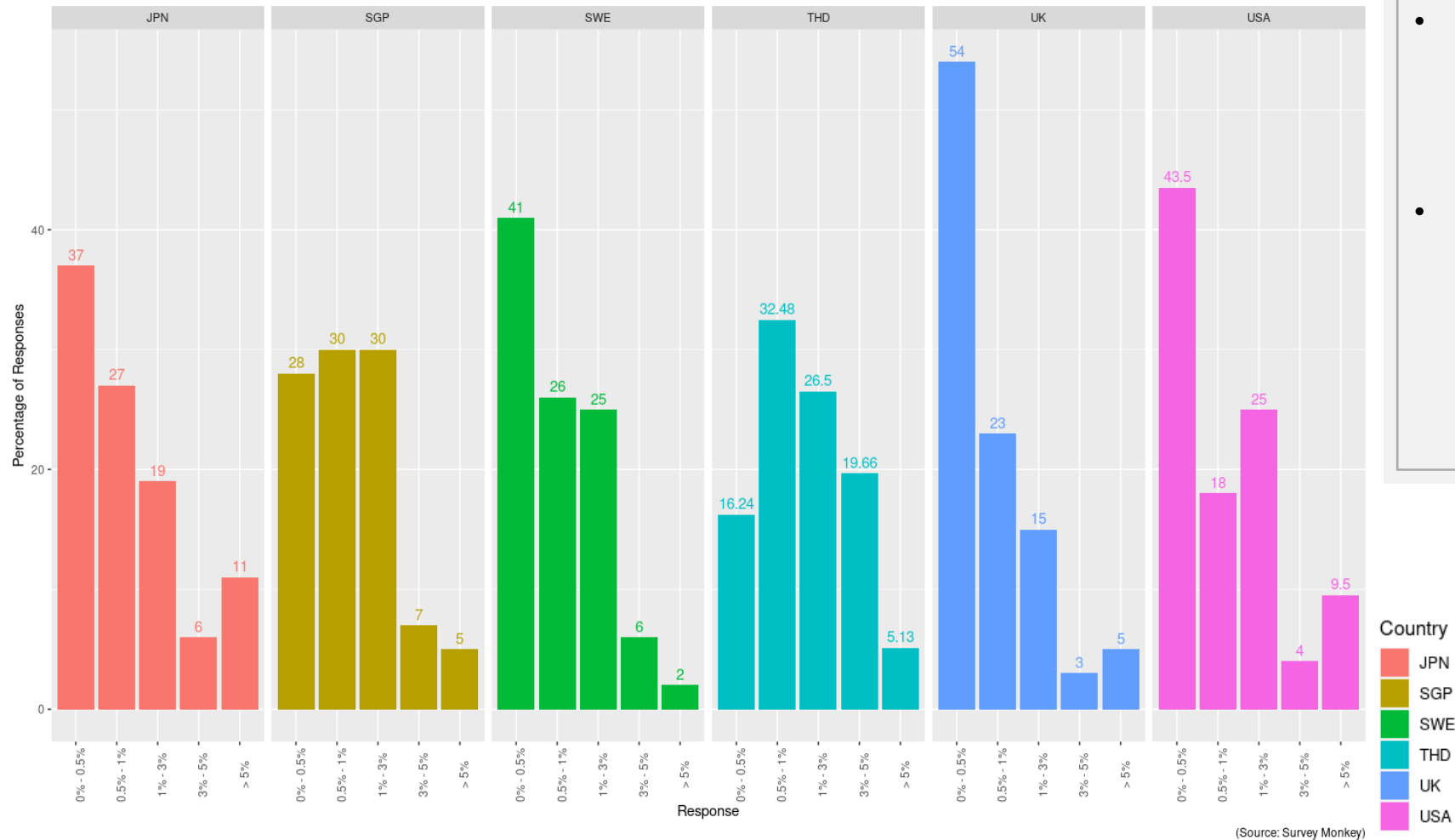


# Consumer Sentiments

## Customer Survey - Survey Monkey

How Much Do you Believe your Current Debit or Credit Card Payments Cost you in Terms of Transaction Fees?

Percentage of Respondents - See Sample Size Table for Actual Counts



- Same as the Qualtrics result, most consumers across multiple countries evaluate their current cost of using credit/debit cards at between 0 and 50bps.
- This conclusively establishes the “cost hurdle” that stablecoins must overcome in order to be competitive against existing methods of payments, and stablecoins must provide substantial incentives to consumers in order for them to switch over from existing payment methods to using stablecoins.

Country	Sample Size
Japan	100
Singapore	100
Sweden	100
Thailand	117
UK	100
USA	200



# 9. Market Size Estimation

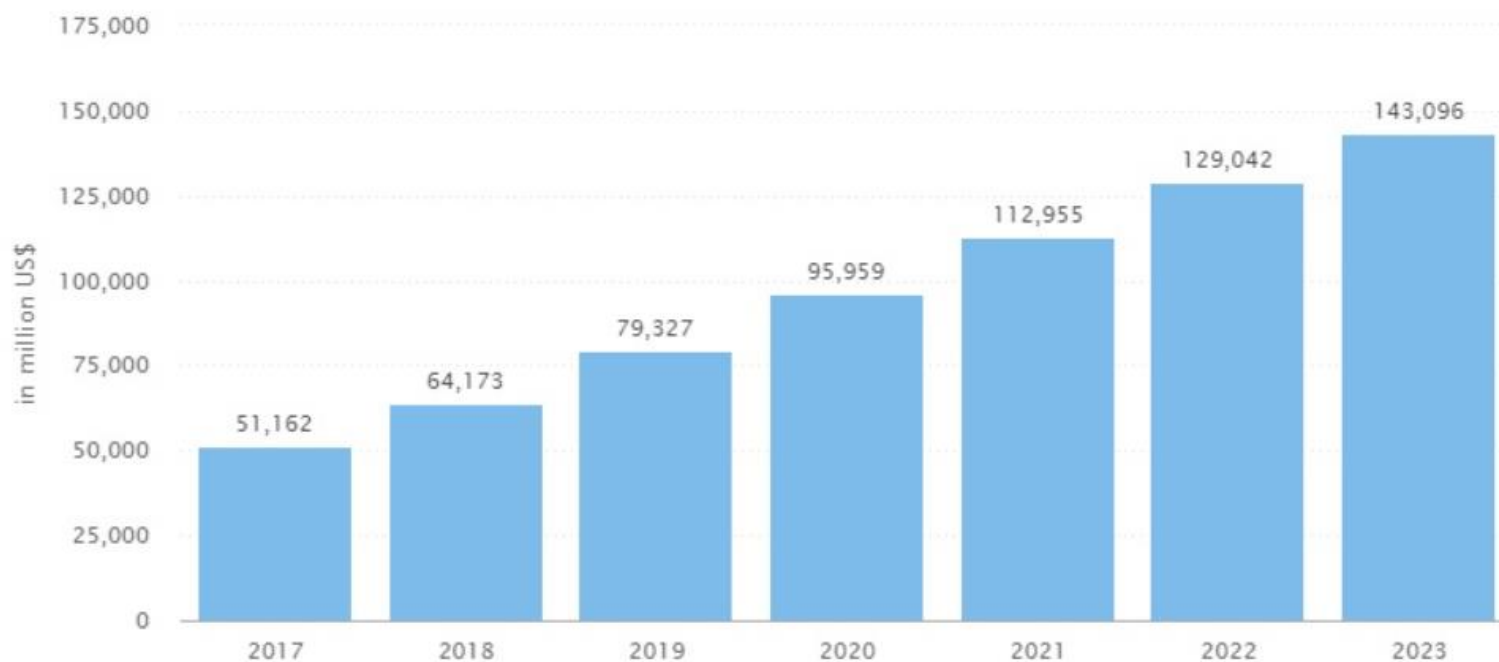
- Cross-border remittances
- Online retail
- NFTs & online gaming
- Travel & other sub-sectors
- Resulting estimate of total market size for SaaPM



## Potential Market Size

### Growth Drivers - Cross-Border Remittances

- The market for total digital cross-border remittances is expected to reach **US\$129B** in 2022
- Based on data collected from our expert interviews + market data, no more than **10%** of the market for digital cross-border remittances will use stablecoins for sending and receiving money
- This translates into a maximum market size of **US\$12.9B**
- **We believe a more realistic assessment is 3% of total volume via stablecoins in 2022**
- Leads to a total stablecoin revenue size of **US\$3.87B in 2022**



*Total Transaction Value of Digital Cross-Border Remittances (Tassev 2020)*

#### Drivers

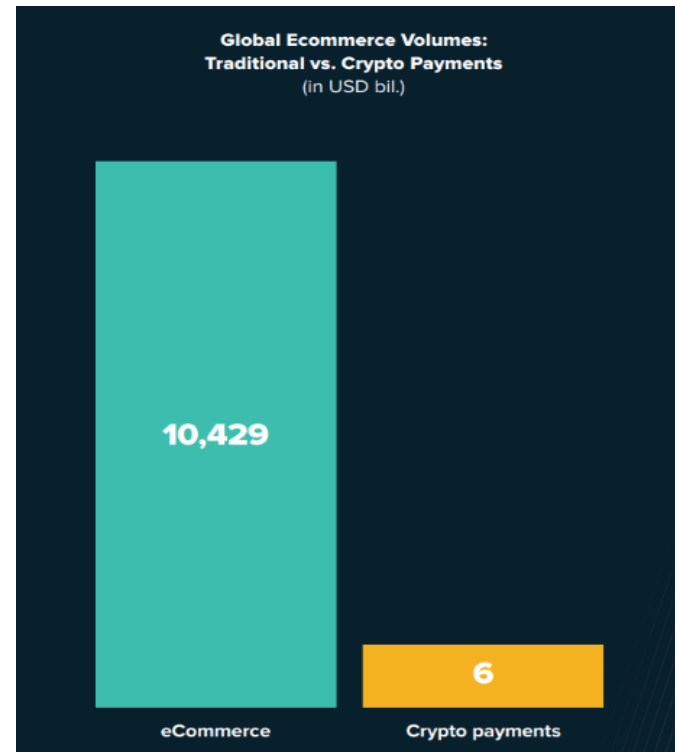
- **Low-fee, high speed, scalable**
- **Increase in margin and sales from potential new customers**



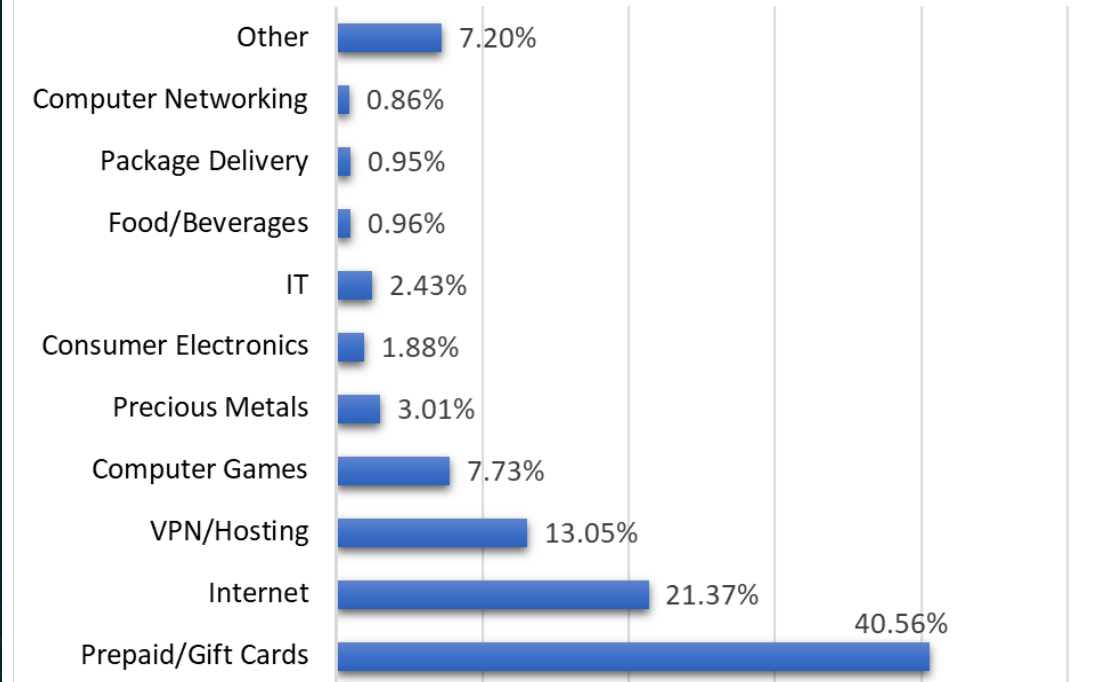
## Potential Market Size

### Growth Drivers - E-Commerce

- Bitpay registered 2.7% of it's revenues from January 2022 based on stablecoins – largest clear number available
- Crypto payments in e-commerce activities amounts to 0.06% of the entire global e-commerce market.
- Based on these calculations, the maximum size of stablecoin payments in e-commerce is likely to be 2.7% of 0.06% of US\$10.4T, that is to say, 0.0016% of the market, or **US\$169M**.



*Projected Global E-Commerce Transaction Volumes in 2022 (Nuvei 2022)*



*BitPay Crypto Transaction Data for Jan 2022 (BitPay 2022)*

#### Drivers

- **Works across borders without requirements to set local connections, settlements, and servicing**
- **Offers privacy and anonymity**

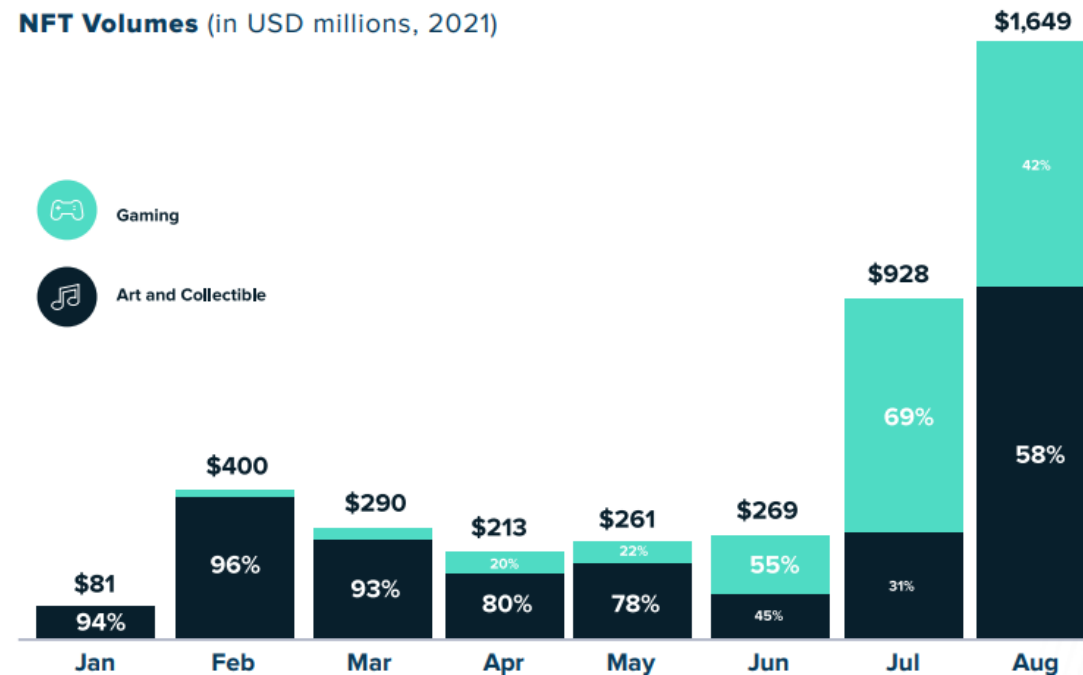


## Potential Market Size

### Growth Drivers - NFTs

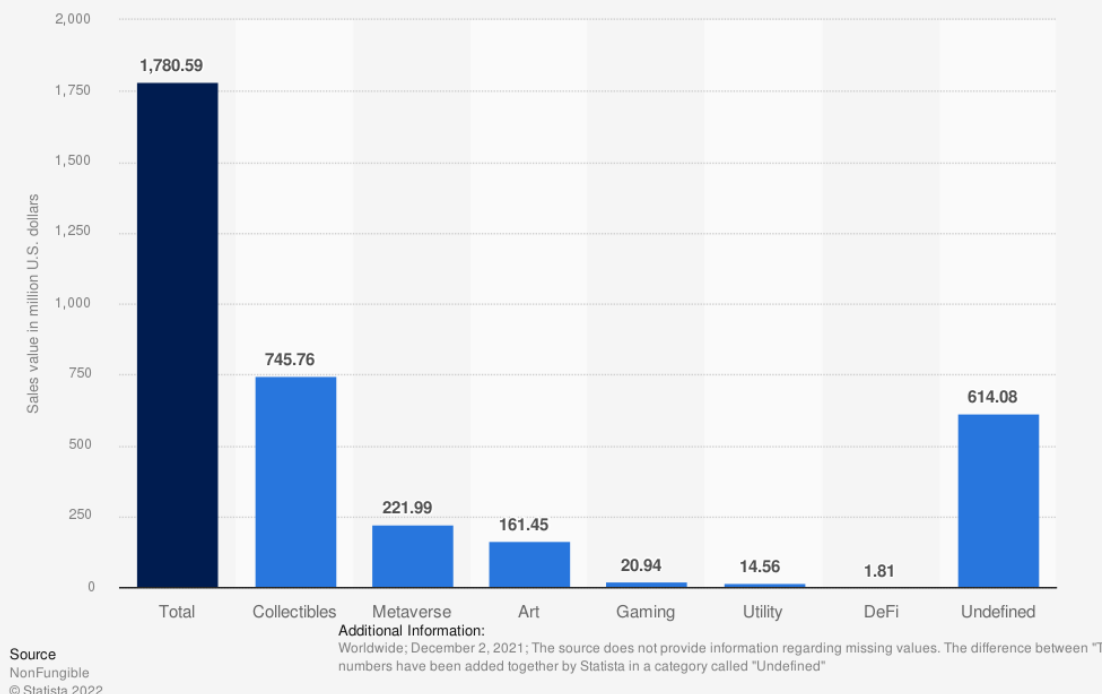
#### Rapid growth in global sales of NFTs, which reached sales of over US\$1.7B in 2021

**NFT Volumes** (in USD millions, 2021)



*NFT Sales Volumes by Category in 2021 (Nuvei 2022)*

**NFT sales volume in the last 30 days as of December 2, 2021, by segment (in million U.S. dollars)**



*NFT Sales in Nov 2021 by Segment (Norrestad 2021)*

- There is a market for stablecoin payments in the area of NFTs
- E.g.: OpenSea is the largest NFT marketplace globally and processed over US\$1.25B in NFT transactions in 2021, or 88% of the global total (Vardai 2022)
- OpenSea accept stablecoins such as DAI, USDC, and other stablecoins for transactions.
- Not possible to determine how much of OpenSea's overall NFT sales volume comes from stablecoins
- *High likelihood* that NFTs are something of a "bubble"



## Potential Market Size

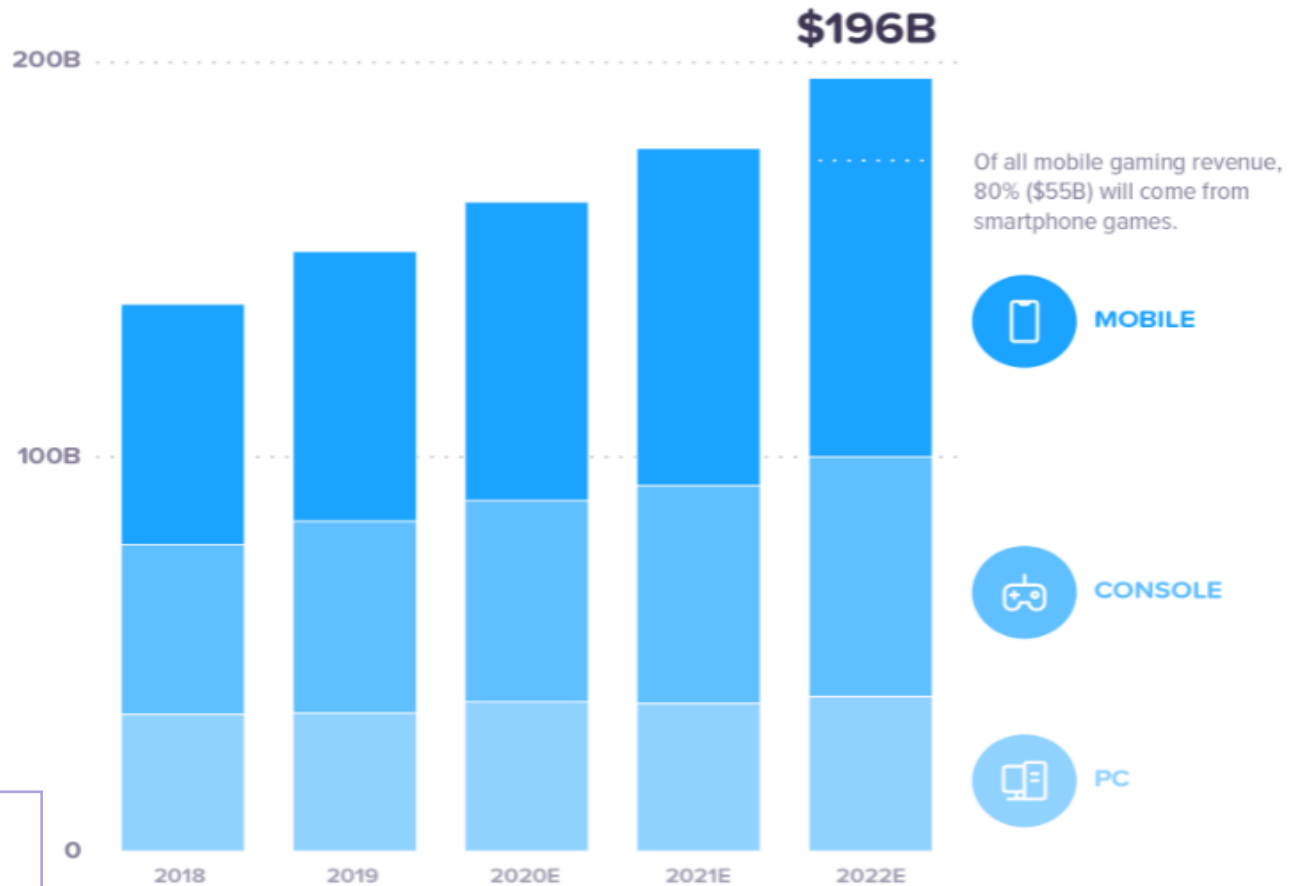
### Growth Drivers - E-Gaming

- Based on analysts projections, the market for online gaming will reach **US\$200B** in sales in 2022
- Due to limited available data, we estimate that 0.03% of total sales will be paid for with stablecoins
- This leads to a maximum likely market size of **US\$60M**

#### Drivers

- Offer to attract specific gaming consumer demographic
- Economic substitute to Cards & Wallets

#### GLOBAL GAME REVENUES



Global Gaming Revenues by Platform 2018-2022E (Circle.com 2021)



## Potential Market Size

### Market Sizing Estimate

#### Current Market Size



- Total size of entire crypto market: **US\$1,726B** (CoinMarketCap, 2022)
- Total size of stablecoin market: **US\$179B** (CoinMarketCap, 2022)
- Total size of top 5 stablecoins: **US\$153B** (CoinMarketCap, 2022)
- About 20% of stablecoins available/used for NON-TRADING purposes = **US\$45.9B** (MAXIMUM POSSIBLE SIZE of stablecoin payments)

#### Market Size by Sub-Industry

1

E-commerce (Nuvei, 2022):



- Total size of e-commerce market: **US\$10,400B**
- Crypto payments % of e-commerce: **0.06%**
- Est. maximum % of crypto payments via stablecoins: **2.7%**

2

Cross-border remittances (The World Bank, 2021):



- Digital cross-border remittances in 2022: **US\$129B**
- Est. max potential payments with stablecoins: **3%**

3

Online gaming (TripleA, 2021):



- Total market revenue in 2022: **US\$200B**
- Est. % of payments in stablecoins: **0.3%**

4

Airlines & travel (Flynn, 2021):



- Total market revenue: **US\$471.8B**
- % payments in crypto: **1.5%**
- Est. % of crypto payments in stablecoin: **5%**

The current size of the stablecoin market for payments is very difficult to assess, due to the lack of transparently available data

#### Potential Market Size



#### Estimate Market Size by Sub-Industry

1

E-commerce:  $10,400 * 0.06\% * 2.7\% = \text{US\$0.169B}$

2

Cross-border transfers:  $129 * 3\% = \text{US\$3.87B}$

3

Online gaming:  $200 * 0.3\% = \text{US\$0.06B}$

4

Airlines & travel:  $471.88 * 1.5\% * 5\% = \text{US\$0.354B}$

- MAX LIKELY SIZE OF MARKET: **US\$13.5B over next 12-36 months**
- Given the lack of visibility and assumptions for future projections (adjusting % of cross border payments through stablecoins to 3%) , **MAX SIZE OF THE MARKET = US\$4.45 B over the next 12-24 months**



# 10. Merchant Adoption of SaaPM

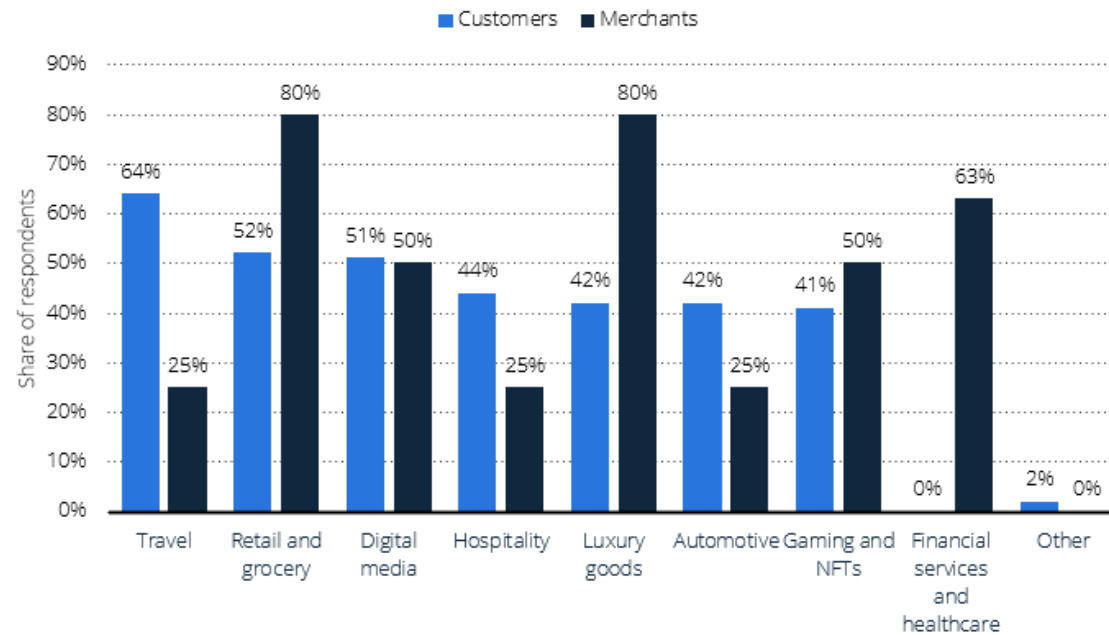
- Variation between consumer and merchant crypto acceptance rates
- Misconceptions preventing wider merchant crypto payment adoption
- Likelihood of CBDCs as a driver of merchant adoption



## Merchant Adoption

### Likely Drivers of Merchant Adoption

#### Willingness to use/accept cryptocurrencies for payments across various industries worldwide as of 2021



**Notes:** Worldwide; Q4 2021; 18 years and older; Various; 10,000 Crypto.com users across geographies, ages and income levels in addition to Worldpay from FIS' global base of 1.5M+ merchants; The source adds that respondents were "heavily concentrated in North America and Europe"  
(Source: Statista, 2022)

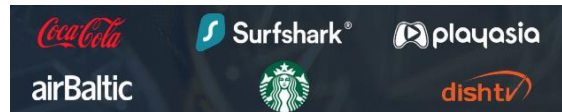
#### Rationale behind merchants' cryptocurrencies acceptance (Nuvei, 2022)

##### TRUE BELIEVERS



- Companies which have interest in the success of the ecosystem (owners of digital assets business or holders of cryptocurrencies)
- Believers in the blockchain and positioning business as crypto native

##### ASPIRATIONAL AND OPPORTUNISTIC



- Buzz-creators
- Companies which aim to be associated with crypto, positioning themselves as innovators
- Companies which aim to expand target addressable market by attractive crypto-native demographic
- Incremental sales
- Economics is not a driver **today**

**Lack of a clear business case due to absence of regulatory clarity and low stablecoins' awareness**



## Merchant Adoption

### Known Issues with Merchant Adoption

#### Merchant Misconceptions of Crypto Payments

Issue	Misconception	Reality
Crypto settlement	Crypto payments mean settlement in crypto	The most widely used model assumes settlement in fiat
Fraud & chargebacks	Crypto acceptance is accompanied by increased level of fraud and chargeback	Low level of fraud due to “push” nature of the payments
Volatility risk	Price fluctuation due to crypto volatility	Case for specific crypto such as Bitcoin. Stablecoins aim to lower that risk
Weak economic/lack of a business case	Crypto payments are perceived as expensive with high mining fees involved	Generally cheaper for merchants compared to cards. Merchant is not involved in mining fees
ESG concerns	Mining process is resource intensive	It is true for Bitcoin, but for emerging cryptocurrencies (stablecoins & CBDCs) mining process is less resource intense

Source: Nuvei, 2022

#### Barriers



##### Regulation

- Lack of regulatory clarity on legal characteristic & taxation
- KYC procedures
- AML & Privacy concern



##### Technology

- Problem with scalability
- Poor user experience in term of speed and usability
- Lack of infrastructure (pre-integrated software, risk management tools)



##### Awareness

- Lack of understanding



## Merchant Adoption



### Assessing Impact of CBDCs as a Driver of Stablecoin Adoption

#### Common policy goals for CBDCs among jurisdictions:

- Financial inclusion and accessibility of payments
- Increase in payment efficiency
- Ensuring payments' resilience
- Reduction of illicit use of money
- Monetary sovereignty
- Competition

#### Key Issues with CBDC Projects Implementation

- Lack of established standards
- Lack of resources (finance, staff etc.)
- Unwillingness to adopt digital payments among population in some jurisdictions (mostly, due to lack of trust in national fiat currency)
- Cyber security risk and technological uncertainty

#### Design of selected CBDC Projects

	Carry Interest or Not	Quantitative Restrictions	Anonymity	Offline	Cross-border payments
<b>Bahamas</b>	No	Yes	For lower tier	Yes/exploring	Future project
<b>Canada</b>	Undecided	Undecided	Undecided	Exploring	International collaboration
<b>China</b>	No	Yes	For lower tier	Yes	Experimenting/international collaboration
<b>ECCU</b>	No	Yes	For lower tier	No	Future project
<b>Sweden</b>	Undecided	Exploring	Undecided	Exploring	International collaboration
<b>Uruguay</b>	No	Yes	Yes, but traceable	No	Possible future project

Source: Soderberg, 2022

#### Target market for WCBDCs:

Countries with strong existing retail banking system

**WCBDCs** provide opportunity for:

- Reduction of operational frictions
- Increase efficiency
- Improve transparency & flexibility

#### Target market for RCBDCs:

Developing countries with weak or non-existent retail banking systems

**RCBDCs** provide opportunity for:

- Leapfrog the retail banking stage of development and jump directly to open digital banking

**CBDCs & Stablecoins coexistence potential:** Yes, except pure RCBDCs model



# 11. Crypto Payments Adoption Scenarios

- Link between Bitcoin and stablecoin adoption
- Current position on adoption curve
- Established scenarios of merchant crypto payments adoption
- Our scenario of adoption

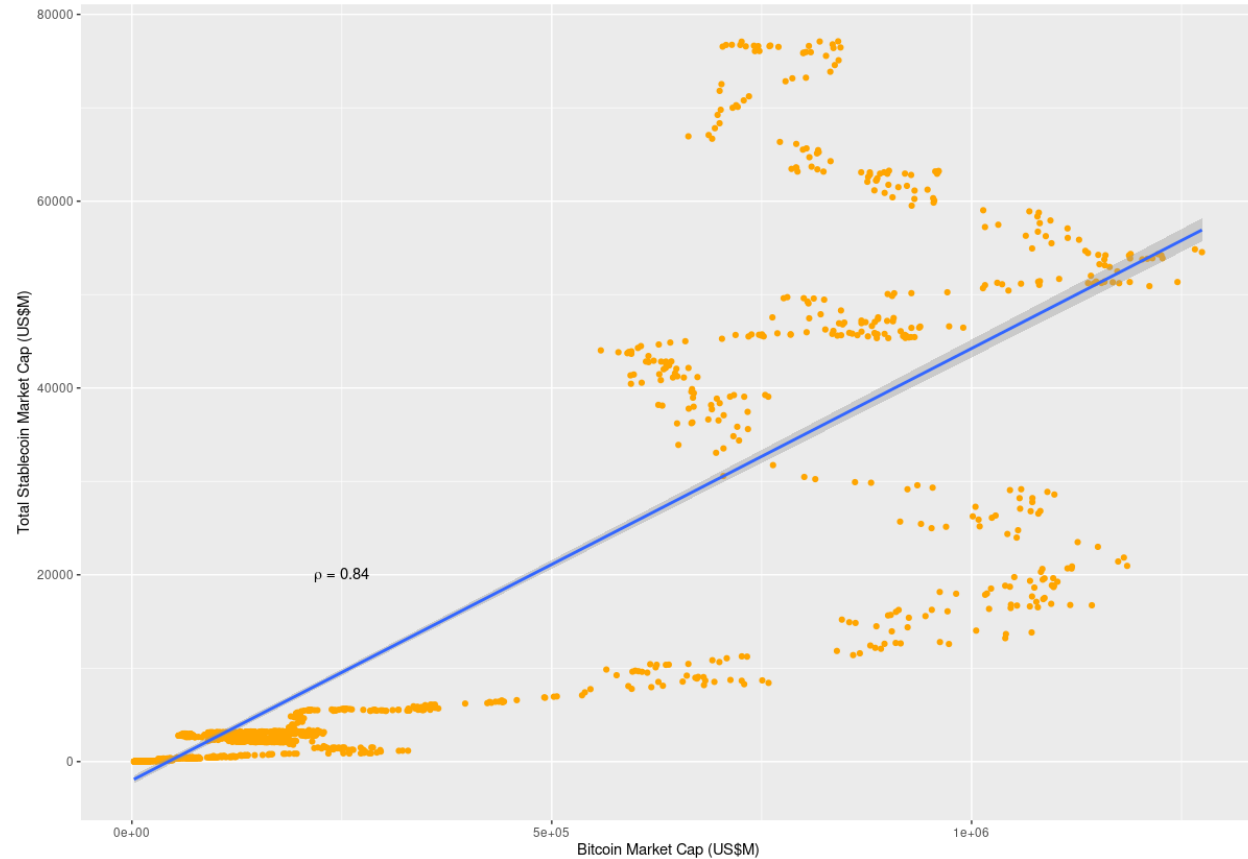


# Scenario Analysis

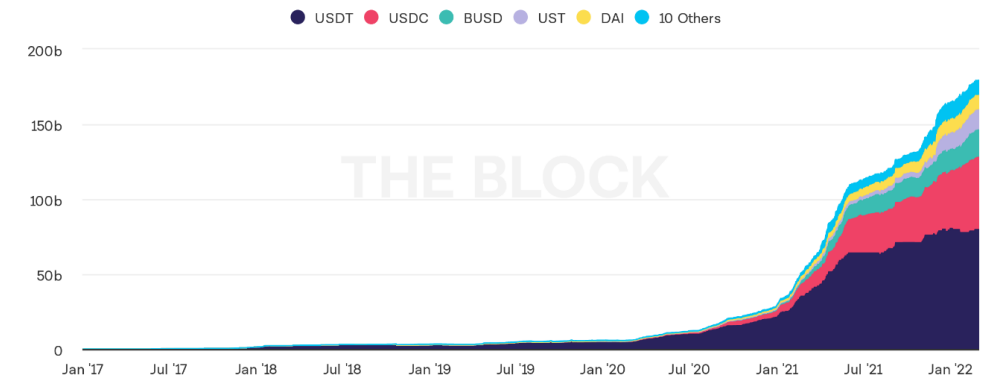
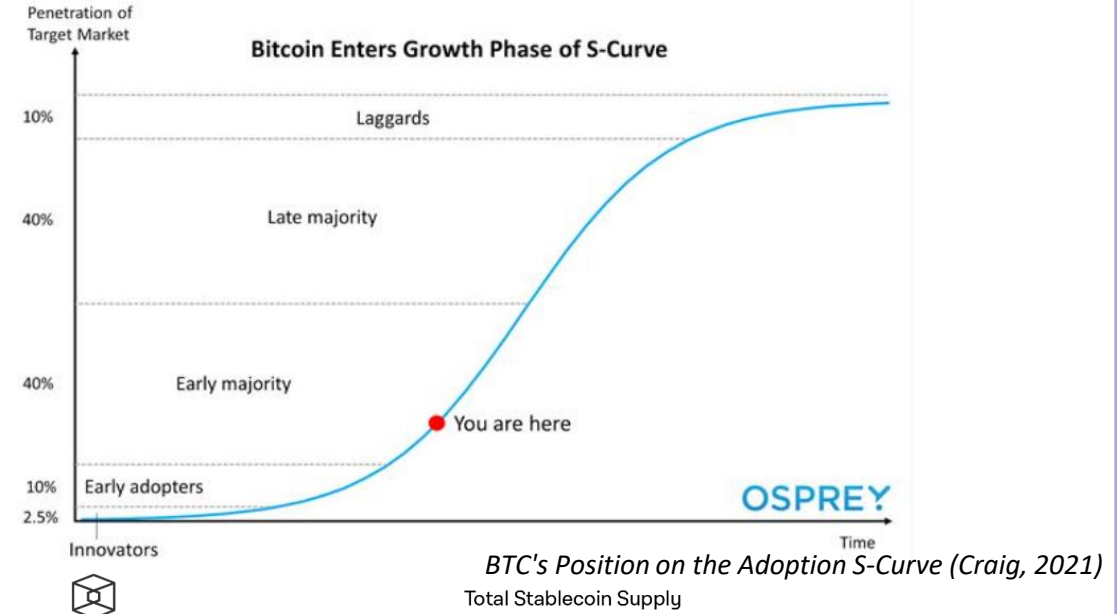
## How Stablecoin Adoption Relates to Bitcoin's Adoption

### Link Between Bitcoin and Stablecoin Market Capitalisation

Relationship Between Stablecoin and Bitcoin Market Capitalisation  
BTC vs Top 5 Stablecoin Market Cap Jan 2015 - Mar 2022



(Source: CoinMetric, 2022)



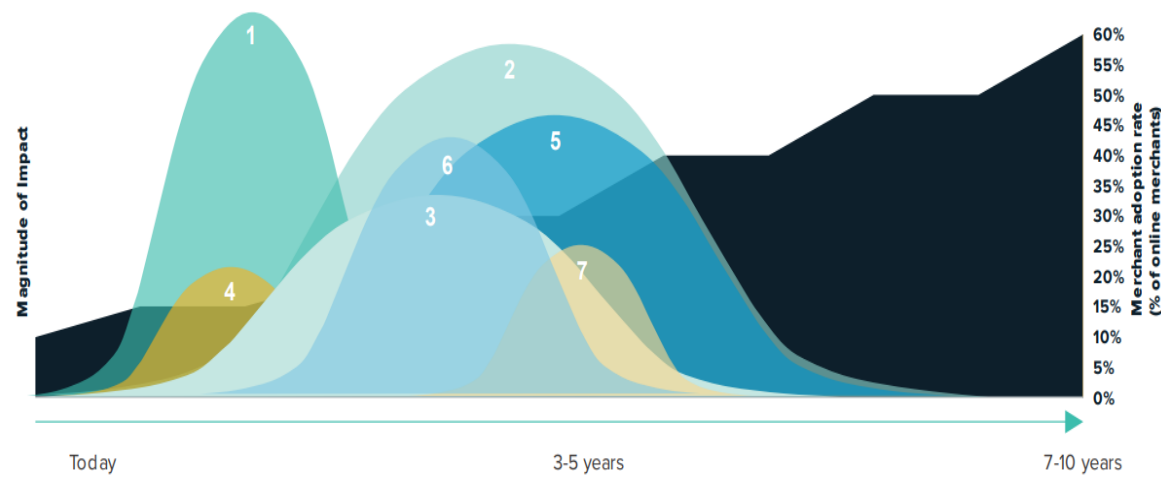
SOURCES: THE BLOCK, COIN METRICS  
UPDATED: MAR 4, 2022

Historical Stablecoin Supply Jan 2017 - Mar 2022 (The Block 2022)



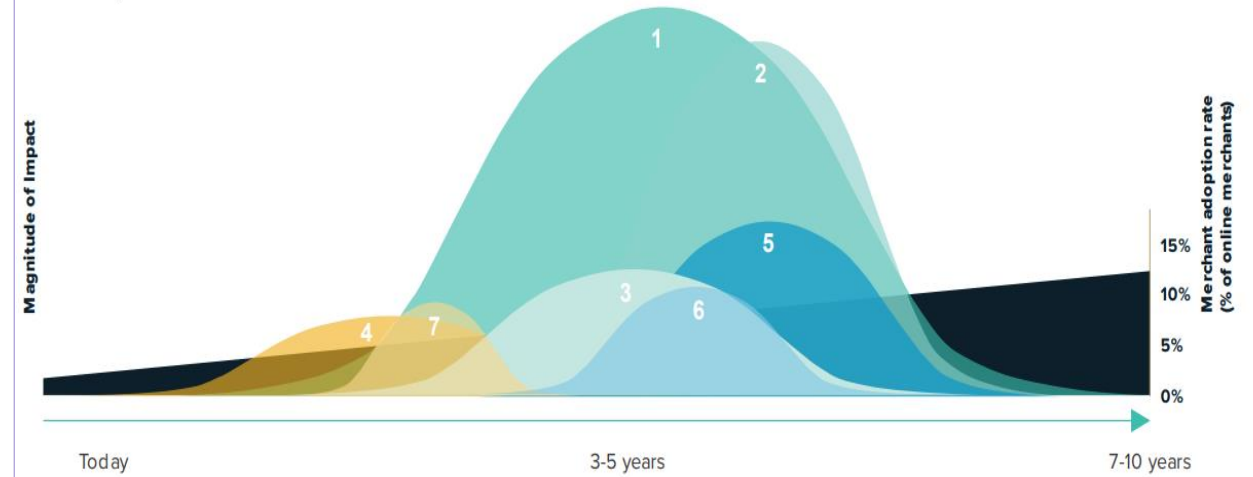
## Scenario Analysis

### Optimistic and Pessimistic Scenarios



- 1 Regulatory clarify and tightening up of global regulations
  - 2 CBDCs to accelerate crypto acceptance and co-exist with cryptocurrencies
  - 3 Stablecoins to mature and increasingly be adopted in C2B commerce
  - 4 NFTs to ride the wave of crypto acceptance
  - 5 Corporate evangelism from traditional payment actors to grow
  - 6 Internet giants well positioned to drive consumer adoption
  - 7 Appeal of crypto in emerging markets likely to drive consumerization
- (Nuvei, 2022)

- Clear regulatory guidance, growth of NFT marketplace will drive crypto payments, initially
- Implementation of CBDCs to act as powerful catalyst for stablecoin acceptance as users seek to avoid volatility in crypto prices.
- **Optimistic Scenario: 60% Merchant Crypto Payments Adoption Rate in 7-10Y**



- 1 Regulatory clarify and tightening up of global regulations
  - 2 CBDCs to accelerate crypto acceptance and co-exist with cryptocurrencies
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  - 4 NFTs to ride the wave of crypto acceptance
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- (Nuvei, 2022)

- Regulation clarity with regards to stable coin is quite late in the process
- CBDC'S aren't a viable payment method for more than 5 years from the present time
- NFT turns out to be a bubble and deflates quickly.
- **Pessimistic Scenario: 12% , Merchant Crypto Payments Adoption Rate in 7-10Y**



# Scenario Analysis



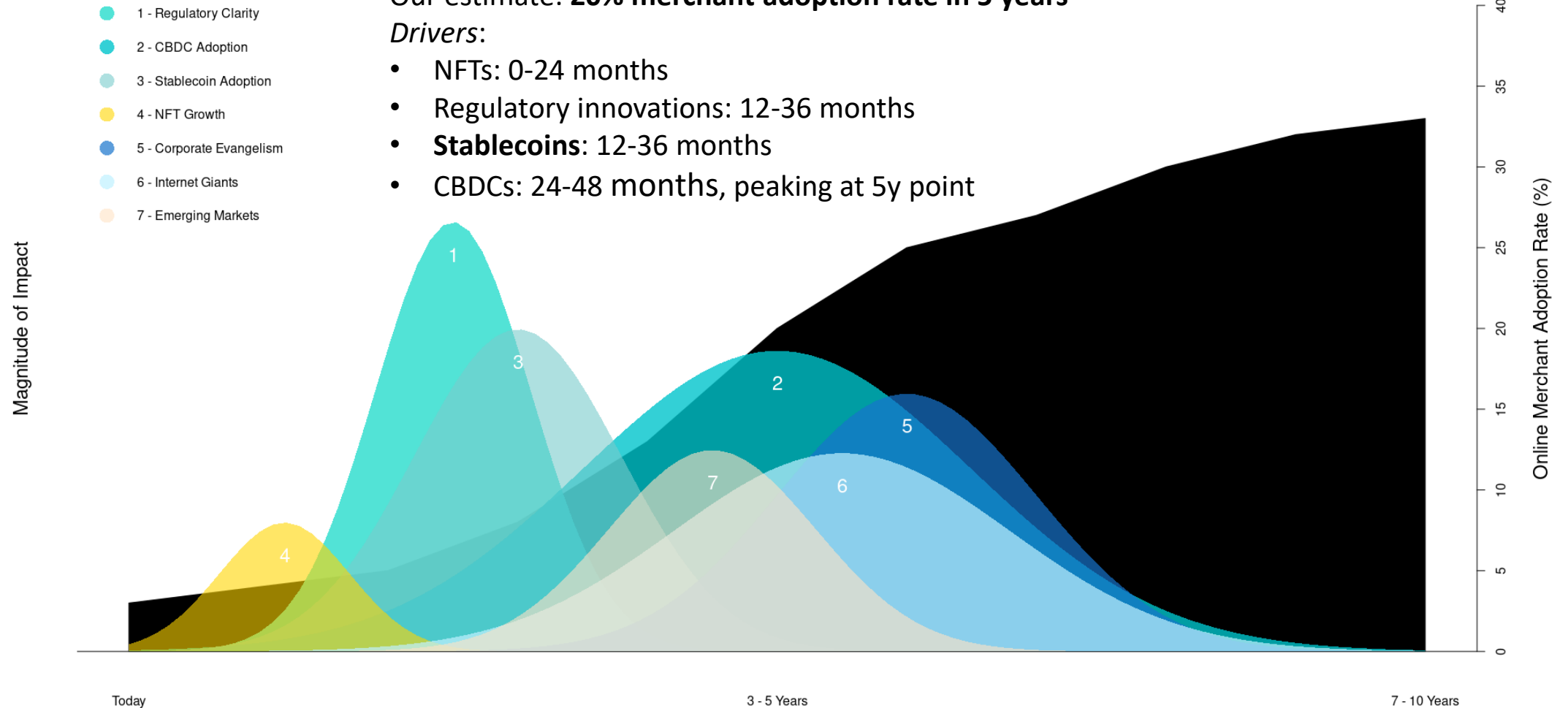
## Realistic Scenario

### Background Merchant Market Share Adoption Rate and Drivers

Our estimate: **20% merchant adoption rate in 5 years**

*Drivers:*

- NFTs: 0-24 months
- Regulatory innovations: 12-36 months
- **Stablecoins**: 12-36 months
- CBDCs: 24-48 months, peaking at 5y point





# 12. Conclusions & Recommendations

- Is SaaPM viable presently?
- What is the future of SaaPM over the next 3 years?
- Where can SaaPM viability be tested?
- How can stablecoins be used for operational and financial optimisation?



## Our Conclusions & Recommendations

### Enabling Stablecoin-Based Payments

#### 10X Advantage Required for Broad Acceptance

- Stablecoins need to be either 10 times faster, or 10 times cheaper, or 10 times easier to use, than any of the existing solutions to become competitive. (\*based on payment processing experts interview)
- **No stablecoin in the market holds anything like these advantages at present**

#### No Clear Advantage Relative to Existing Methods

- Stablecoins cannot compete with payment processor technical capabilities and speeds at present
- Stablecoins do not presently show a compelling reason to switch away from existing payment methods entirely



- **We find NO large-scale consumer-driven demand** for stablecoins as a payment method currently
- **Too small a market for stablecoin-based retail and online payments** at this point
- **No ability to scale market fast enough** to justify broad-based stablecoin payments



- We do find niche areas with **growth opportunities**
- **Strong consumer interest** in using stablecoins
- A number of sub-sectors of interest driving broader adoption of stablecoin payments. The value of stablecoin payments is minimal at present, but they all exhibit substantial growth potential over the next 1-5 years.
- **Although SaaPM is not viable now, it is likely to be so within 3 years**



## Our Conclusions & Recommendations

### Testing the Market for Future Enablement

#### Recommendation



**Setup SaaPM test case in Singapore for financial/payment processing companies interested in SaaPM**

#### Prize



- If the stablecoin market develops rapidly, business opportunities will not be missed
- The data gathered from this trial can then be used to setup similar test cases in other markets at a later date when the regulatory and technological environments become more favourable



#### Why Singapore?

- Stable regulatory environment
- Advanced technological infrastructure for crypto payments.
- Leading country in Asia in digital payments



(Source: our expert interviews)

#### Recommended Trial

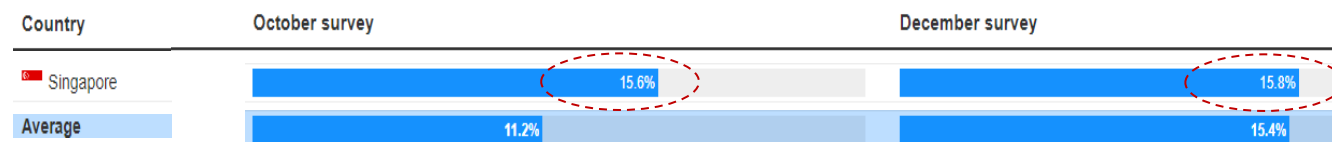
Invite **at least 1000 crypto users** who hold cryptocurrencies to participate in a trial involving stablecoin payments through fiat-backed stablecoins only.

#### Initial sample size achievable

Singapore's current population of over 5.8 million (*Worldometer 2022*), over 4.8 million active internet users (*Muller 2021*), and the fact that over 15% of active internet users in Singapore own and use cryptocurrencies.

#### Takeaway

These combined statistics yield a potential sample size of nearly **760,000 possible users** with valuable information about **issues encountered, costs involved, use cases, and transaction speeds.**



Cryptocurrency Adoption Rates (*Laycock 2021*) \*Excerpts from Singapore only



## Our Conclusions & Recommendations

### Testing the Market for Future Enablement

#### Recommendation



**Setup SaaPM test case in UK in H2 2022 to test comprehensive merchant and consumer adoption interest**

#### Prize



- UK-based respondents to surveys have already indicated a willingness to use stablecoins for payments
- Government regulatory clarity around stablecoin payments is key to driving adoption
- Decision is likely to spur substantial interest in a real GBP stablecoin



#### Why UK?

- Friendly regulatory environment for stablecoin payments
- Highly advanced existing payments infrastructure
- Regulators keen to ensure innovation without undue risk

(Source: our expert interviews)

#### Recommended Trial

Invite **at least 5,000 crypto users** who hold cryptocurrencies to participate in a trial involving stablecoin payments through fiat-backed stablecoins only.

Invite at least 200 online merchants and retailers to test stablecoin payments and settlements

#### Initial sample size achievable

UK's current population of nearly 68 million (*Worldometer 2022*)

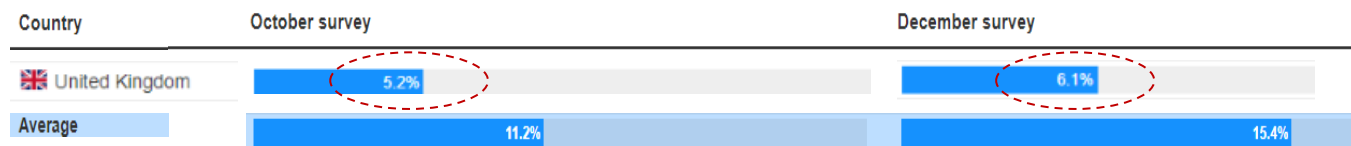
63M internet users (*Johnson 2021*)

Over 6% of active internet users in UK own and use cryptocurrencies users (*Laycock 2021*).

#### Takeaway

These combined statistics yield a potential sample size of **3.84M possible users** with valuable information about **issues encountered, costs involved, use cases, and transaction speeds**.

Merchant involvement will provide data about settlement issues and cash flows.

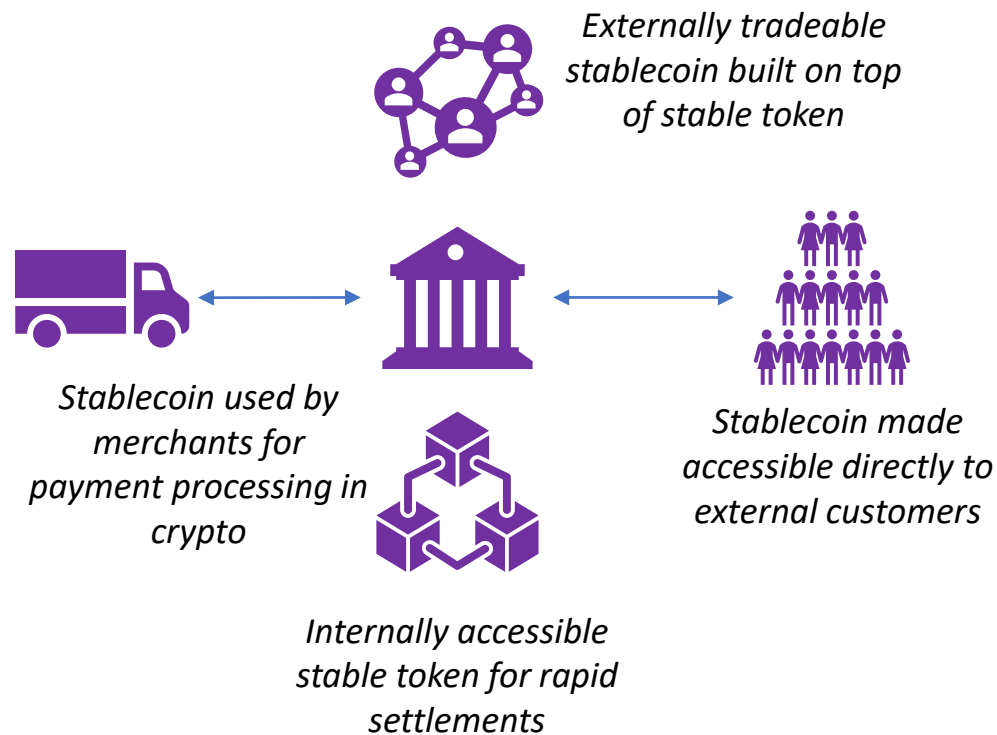


Cryptocurrency Adoption Rates (*Laycock 2021*) \*Excerpts from UK only



## Our Conclusions & Recommendations

### Creating an Internal Stablecoin



- JP Morgan has already launched its own internal JPM Coin, now turned into an external stablecoin
- JPM Coin cuts down on settlements of internal cash flows from 1-2 days, to a few minutes (BANKUS 2019)
- JPM Coin is now an externally available stablecoin available for cross-border settlements and payments (Hamilton 2019)
- Provides clear template for creating an internal stablecoin that can translate to external payment facilitator
  - Start with internal stable token (similar to GreenBox POS use case)
  - Use to rapidly speed up internal settlements of cash flows
  - Transition to stablecoin for external use to facilitate payments
- Monetisation of stablecoin can come from yields offered by institutional crypto traders for fiat-backed hedging instruments
- Major drawback is the requirement to keep large attested cash reserves on balance sheet



# THANK YOU

## *Questions?*

Please contact one of our team members to follow up:

- [Sarbojeet Saha](#) – Team Leader & Principal Author
- [Kaoru Chigahara](#) – Asian Markets Research Specialist
- [Evgeniia Podosinnikova](#) – European Markets Research Specialist
- [Arjun Sharad](#) – Blockchain Technology Specialist
- [Amer Al-Somali](#) – Commercial Applications Specialist

See our comprehensive report for additional information, data, research, and insights



# REFERENCES & APPENDICES



# 13. References



# References

- airBaltic. (2021). airBaltic Bitcoin payments extended by various crypto currencies. [online]. Available from: <https://www.airbaltic.com/en/airbaltic-bitcoin-payments-extended-by-various-crypto-currencies> [Accessed February 22, 2022].
- Alper, T. (2021). LUNA on the Rise as South Korean City Mulls Terra Stablecoin Proposal. [online]. Available from: <https://cryptonews.com/news/luna-on-the-rise-as-south-korean-city-mulls-terra-stablecoin-10064.htm> [Accessed February 21, 2022].
- Axie Infinity. 2022. Axie Infinity. [online] Available at: <https://axieinfinity.com/> [Accessed 23 February 2022].
- Bank of Thailand. “Joint Press Release: BOT, SEC, and MOF to Jointly Set Guidelines on the Usage of Digital Assets as a Means of Payment for Goods and Services.” *Www.bot.or.th*, 25 Jan. 2022, [online] Available at: [www.bot.or.th/English/AboutBOT/Activities/Pages/JointPress\\_25012022.aspx](http://www.bot.or.th/English/AboutBOT/Activities/Pages/JointPress_25012022.aspx). [Accessed 23 Mar. 2022].
- BANKUS. (2019). JP Morgan Creates a Digital Coin. [online]. Available from: <https://www.banknovelties.com/article-22.html> [Accessed March 23, 2022].
- Baydakova, A. (2022). Russia’s Finance Ministry Opposes Central Bank Call for Crypto Ban. [online]. Available from: <https://www.coindesk.com/policy/2022/01/25/russias-finance-ministry-opposes-central-bank-call-for-crypto-ban/> [Accessed February 20, 2022].



# References

- Bitpay. 2022. *BitPay Stats - Blockchain Payment Statistics*. [online] Available at: <https://bitpay.com/stats/> [Accessed 23 February 2022].
- Blog.makerdao.com. 2020. Let's Play: Introducing Maker's Dai Gaming Initiative. [online] Available at: <https://blog.makerdao.com/dai-gaming-initiative/> [Accessed 23 February 2022].
- Broadbent, Grace. "Stablecoin Payments Pick Up, Challenging Bitcoin as the Dominant Payments Coin." Business Insider, 19 Jan. 2022. [online]. Available from: [www.businessinsider.com/bitpay-users-turning-to-stablecoins-for-crypto-payments-2022-1?op=1&r=US&IR=T](https://www.businessinsider.com/bitpay-users-turning-to-stablecoins-for-crypto-payments-2022-1?op=1&r=US&IR=T). [Accessed February 16, 2022].
- CBDC Tracker. (2022). Central Bank Digital Currency (CBDC) Tracker. Central Bank Digital Currency (CBDC) Tracker. [online]. Available from: <https://cbdctracker.org/> [Accessed February 21, 2022].
- CCN. (2019). Huge! Amazon-Owned Whole Foods Buys Crypto by Accepting Bitcoin. [online]. Available from: <https://www.ccn.com/amazon-whole-foods-accepting-bitcoin/> [Accessed February 16, 2022].
- CFTC. (2021). CFTC Orders Tether and Bitfinex to Pay Fines Totaling \$42.5 Million | CFTC. [online]. Available from: <https://www.cftc.gov/PressRoom/PressReleases/8450-21> [Accessed February 20, 2022].
- CGI GROUP INC. (2017). CGI Global Payments Research. [online]. Available from: <https://www.cgi.com/sites/default/files/pdf/cgi-global-payments-research.pdf>.



# References

- Chorzempa, M. (2021). Promise and Peril of Digital Money in China. Cato Institute. [online]. Available from: <https://www.cato.org/cato-journal/spring/summer-2021/promise-peril-digital-money-china> [Accessed February 21, 2022].
- Circle. “Circle Integration with Plaid Brings Speed and Ease to Bank Verifications.” [Www.circle.com](https://www.circle.com/blog/circle-integration-with-plaid-brings-speed-and-ease-to-bank-verifications-1), 23 Sept. 2021.[online]. Available from: [www.circle.com/blog/circle-integration-with-plaid-brings-speed-and-ease-to-bank-verifications-1](https://www.circle.com/blog/circle-integration-with-plaid-brings-speed-and-ease-to-bank-verifications-1). [Accessed February 16, 2022].
- Circle.com. 2021. How Blockchain Gaming Companies Can Use Stablecoins. [online] Available at: <https://www.circle.com/en/digital-dollar-stablecoin-solutions-for-gaming#:~:text=Through%20the%20integration%20of%20stablecoins,to%20spend%20more%20time%20gaming>. [Accessed 23 February 2022].
- CoinMarketCap Alexandria. (2021). What Are Cryptocurrency Layer 2 Scaling Solutions? | CoinMarketCap. [online] Available at: <https://coinmarketcap.com/alexandria/article/what-are-cryptocurrency-layer-2-scaling-solutions>. [Accessed February 16, 2022]
- Craig, J. (2021). Where is Bitcoin in the Adoption Curve (S Curve)? - Phemex Academy. *Phemex*. [online]. Available from: <https://phemex.com/blogs/crypto-bitcoin-s-curve-adoption-curve> [Accessed March 8, 2022]
- CryptoRefills. (2021). ‘Cryptocurrencies in Retail: Consumer Adoption Report 2021’ by CryptoRefills Labs. CryptoRefills. [online]. Available from: <https://www.cryptorefills.com/blog/cryptocurrencies-in-retail-consumer-adoption-report-2021-cryptorefills-labs/> [Accessed February 20, 2022].



# References

- DeLong, J. (2020). JPMorgan Begins Commercial Use Of Its New Digital Coin; Creates New Unit For Blockchain Projects. [online]. Available from: <https://www.digitalmarketnews.com/jpmorgan-begins-commercial-use-of-its-new-digital-coin-creates-new-unit-for-blockchain-projects/> [Accessed March 23, 2022].
- DeLuca, J.V. (2022). Are Cryptocurrencies a Viable Payment Option for Airlines? Kambr Media. [online]. Available from: <https://www.kambr.media/articles/cryptocurrencies-viable-payment-option-for-airlines> [Accessed February 14, 2022].
- DiCamillo, N. (2021). The US is dragging its heels on critical stablecoin regulations. [online] Quartz. Available at: <https://qz.com/2083636/what-are-stablecoins-and-how-will-they-be-regulated/#:~:text=The%20report%2C%20prepared%20by%20the> [Accessed 20 Feb. 2022].
- Flynn, J. (2021). Airline Industry Statistics [2022]: 28 Facts To Know Before You Fly – Zippia. [online]. Available from: <https://www.zippia.com/advice/airline-industry-statistics/> [Accessed March 8, 2022].
- Frost & Sullivan. (2020). Blockchain: Regulating the New Economy, March 2020. [Accessed February 16, 2022].
- Gibson, A. International Bank Transfers (Clearly Explained). [online]. Available from: <https://www.keycurrency.co.uk/international-bank-transfer/> [Accessed February 21, 2022].
- Hamilton, A. (2019). JP Morgan creates crypto for international settlements » PaymentEye. [online]. Available from: <https://www.paymenteye.com/2019/02/15/jp-morgan-creates-crypto-for-international-settlements/> [Accessed March 23, 2022].



# References

- Helms, K. (2021). Many Major Airlines Can Now Accept Cryptocurrencies via UATP Global Payment Network – Featured Bitcoin News. Bitcoin News. [online]. Available from: <https://news.bitcoin.com/many-major-airlines-can-now-accept-cryptocurrencies-via-uatp-global-payment-network/> [Accessed February 22, 2022].
- Johnson, J. (2021). Topic: Internet usage in the UK. Statista. [online]. Available from: <http://www.statista.com/topics/3246/internet-usage-in-the-uk/> [Accessed April 12, 2022].
- Laycock, R. (2021). Finder Cryptocurrency Adoption Index. *finder.com*. [online]. Available from: <https://www.finder.com/finder-cryptocurrency-adoption-index> [Accessed March 7, 2022].
- Li, K. (2019). The Blockchain Scalability Problem & the Race for Visa-Like Transaction Speed. Medium. [online]. Available from: <https://towardsdatascience.com/the-blockchain-scalability-problem-the-race-for-visa-like-transaction-speed-5cce48f9d44> [Accessed February 21, 2022].
- Mizrach, B. (2021). Stablecoins: Survivorship, Transactions Costs and Exchange Microstructure. Rochester, NY: Social Science Research Network. [online]. Available from: <https://papers.ssrn.com/abstract=3835219> [Accessed February 20, 2022].
- Muller, J. (2021). Topic: Internet usage in Singapore. *Statista*. [online]. Available from: <https://www.statista.com/topics/5852/internet-usage-in-singapore/> [Accessed March 29, 2022].
- Munoz, E. (2017). 5 Easy Steps to Buy and Manage Cryptocurrency | by Eddy Muñoz | cryptograds | Medium. [online]. Available from: <https://medium.com/cryptograds/5-easy-steps-to-start-investing-in-cryptocurrency-83f18403e2dc> [Accessed February 22, 2022].
- Nippon Yusen Kabushiki Kaisha. (2019) “NYK Establishes ‘MarCoPay,’ an Electronic Money Platform Business to Expand Globally.” NYK Line, 25 July 2019. [online]. Available from: [www.nyk.com/english/news/2019/20190725\\_01.html](http://www.nyk.com/english/news/2019/20190725_01.html). [Accessed 17 Feb. 2022].



# References

- Nippon Yusen Kabushiki Kaisha. (2021) “Diversity & Inclusion.” NYK Line, 2021. [online]. Available from: [www.nyk.com/english/esg/social/diversity/](http://www.nyk.com/english/esg/social/diversity/). [Accessed 17 Feb. 2022].
- Nippon Yusen Kabushiki Kaisha. (2021) “NYK Begins Payment of Seafarers’ Salaries in Digital Currency.” NYK Line, 10 June 2021. [online]. Available from: [www.nyk.com/english/news/2021/20210610\\_02.html](http://www.nyk.com/english/news/2021/20210610_02.html). [Accessed 17 Feb. 2022].
- Nippon Yusen Kabushiki Kaisha. (2022) “NYK Line.” NYK Line, 2022. [online]. Available from: [www.nyk.com/english/](http://www.nyk.com/english/). [Accessed 17 Feb. 2022].
- Nippon Yusen Kabushiki Kaisha.(2021) “Marubeni, NYK, and TDG Agree on Joint Promotion of Electronic Money Platform Business for Seafarers.” NYK Line, 21 June 2021. [online]. Available from: [www.nyk.com/english/news/2021/20210621\\_01.html](http://www.nyk.com/english/news/2021/20210621_01.html). [Accessed 17 Feb. 2022].
- Nuvei, 2022. *The future of crypto payments*. [online] Nuvei. Available at: [https://try.nuvei.com/cwp01/?utm\\_source=The\\_Paypers&utm\\_medium=Website\\_Banner&utm\\_campaign=Crypto\\_WP](https://try.nuvei.com/cwp01/?utm_source=The_Paypers&utm_medium=Website_Banner&utm_campaign=Crypto_WP) [Accessed 3 March 2022].
- Ononeme, S. (2020). What is Central Bank Digital Currency (CBDC)? Everything You Need to Know. AtoZ Markets - Forex News & Trading Tools. [online]. Available from: <https://atozmarkets.com/news/what-is-central-bank-digital-currency-cbdc/> [Accessed February 20, 2022].



# References

- polygon.technology. (2022). Bring the World to Ethereum | Polygon. [online]. Available from: <https://polygon.technology/> [Accessed February 20, 2022].
- PYMNTS, and BitPay. (Mar. 2021). Cryptocurrency Payments Report. [online]. Available from: <https://www.pymnts.com/wp-content/uploads/2021/05/PYMNTS-Cryptocurrency-Payments-Report-May-2021.pdf>. [Accessed February 16, 2022].
- Ripple. 2022. XRP: Digital Asset for Real-Time Global Payments | Ripple. [online] Available at: <https://ripple.com/xrp/> [Accessed 23 February 2022].
- Rozsa, A. (2022). Making an international wire transfer: How-to guide. Wise. [online]. Available from: <https://wise.com/us/blog/making-an-international-wire-transfer> [Accessed February 21, 2022].
- Secular Growth Stories. (2021). GreenBox POS (GBOX): Payment Processing With Blockchain Tech | Seeking Alpha. [online]. Available from: <https://seekingalpha.com/article/4416783-greenbox-pos-blockchain-stablecoin-payment-processing-impact>, <https://seekingalpha.com/article/4416783-greenbox-pos-blockchain-stablecoin-payment-processing-impact> [Accessed February 20, 2022].
- Secular Growth Stories. “GreenBox POS: How Blockchain and Stablecoin Will Impact the Payment Processing Industry.” Seeking Alpha, 30 Mar. 2021. Available from: [seekingalpha.com/article/4416783-greenbox-pos-blockchain-stablecoin-payment-processing-impact](https://seekingalpha.com/article/4416783-greenbox-pos-blockchain-stablecoin-payment-processing-impact) [Accessed February 16, 2022]



# References

- Seeh, F. (2021). How new entrants are redefining cross-border payments. [online]. Available from: [https://www.ey.com/en\\_gl/banking-capital-markets/how-new-entrants-are-redefining-cross-border-payments](https://www.ey.com/en_gl/banking-capital-markets/how-new-entrants-are-redefining-cross-border-payments) [Accessed February 21, 2022].
- Sephton, C. (2022). U.K. to Make Stablecoins a Recognized Payment Method, Relax Crypto Rules, and Release NFT | CoinMarketCap. CoinMarketCap Alexandria. [online]. Available from: <https://coinmarketcap.com/alexandria/article/u-k-to-make-stablecoins-a-recognized-payment-method-relax-crypto-rules-and-release-nft> [Accessed April 8, 2022].
- Soderberg, G., 2022. FINTECH NOTES: Behind the Scenes of Central Bank Digital Currency. [online] www.imf.org. Available at: <https://www.imf.org/-/media/Files/Publications/FTN063/2022/FTNEA2022004.ashx> [Accessed 25 March 2022].
- Statista, 2021. Willingness to use/accept cryptocurrencies for payments by consumers/merchants across various industries worldwide as of 2021. [online] Available at: <https://www-statista-com.manchester.idm.oclc.org/statistics/1290483/crypto-payment-acceptance-by-industry/> [Accessed 6 March 2022].
- Statista. 2021. Largest NFT marketplaces based on all-time sales volume as of November 11, 2021 (in million U.S. dollars). [online] Available at: <https://www-statista-com.manchester.idm.oclc.org/statistics/1274843/nft-marketplaces-with-highest-volume/> [Accessed 23 February 2022].
- Tassev, L. (2020). Digital Remittances Reach Record of \$96 Billion YoY, High Fees Open Door for Cryptocurrencies – Fintech Bitcoin News. Bitcoin News. [online]. Available from: <https://news.bitcoin.com/digital-remittances-reach-96-billion/> [Accessed March 7, 2022].
- The Block Research Report (2021). The Block Research Report \_ 2022 Digital Asset Outlook. [online]. Available from: <https://www.tbstat.com/wp/uploads/2021/12/The-Block-Research-2022-Digital-Asset-Outlook.v2.pdf> [Accessed February 16, 2022].



# References

- The Block. (2021.). Stablecoin Performance Metrics, Charts, and Trends. [online] Available at: <https://www.theblockcrypto.com/data/decentralized-finance/stablecoins> [Accessed 20 Feb. 2022].
- The Block. (2022). Stablecoin Volumes. [online]. Available from: <https://www.theblockcrypto.com/data/decentralized-finance/stablecoins> [Accessed November 14, 2021].
- The Stellar Development Foundation. (2022). Okcoin Becomes First U.S. Exchange to Integrate Stellar USDC. [online]. Available from: <https://www.prnewswire.com/news-releases/okcoin-becomes-first-us-exchange-to-integrate-stellar-usdc-301479320.html> [Accessed February 20, 2022].
- The Washington Post. *Thailand Bans Cryptocurrency Payments for Goods and Services*. 23 Mar. 2022, [online] Available at: [www.washingtonpost.com/business/thailand-bans-cryptocurrency-payments-for-goods-and-services/2022/03/23/e8b6391a-aaa1-11ec-8a8e-9c6e9fc7a0de\\_story.html](https://www.washingtonpost.com/business/thailand-bans-cryptocurrency-payments-for-goods-and-services/2022/03/23/e8b6391a-aaa1-11ec-8a8e-9c6e9fc7a0de_story.html). [Accessed 23 Mar. 2022].
- The World Bank. (2021). Remittance Flows Register Robust 7.3 Percent Growth in 2021. *World Bank*. [online]. Available from: <https://www.worldbank.org/en/news/press-release/2021/11/17/remittance-flows-register-robust-7-3-percent-growth-in-2021> [Accessed March 4, 2022].
- Thurman, A., 2022. Axie Infinity's Gaming Sidechain Is Bigger Than Many Major Layer 1s by Volume: Nansen. [online] Coindesk.com. Available at: <https://www.coindesk.com/tech/2022/01/11/axie-infinitys-gaming-sidechain-is-bigger-than-many-major-l1s-by-volume-nansen-report/> [Accessed 23 February 2022].



# References

- TripleA. (2021). Crypto Ownership Data for Gaming Industry 2021. *TripleA*. [online]. Available from: <https://triple-a.io/crypto-gaming-industry/> [Accessed March 7, 2022].
- VISA. (2021). The Visa back to Business Study 2021 Outlook. [online]. Available from: <https://usa.visa.com/dam/VCOM/blogs/visa-back-to-business-study-jan21.pdf> [Accessed February 16, 2022].
- Walker, M., 2019. Do six per cent of financial transactions sent via the Swift system really fail?. [online] LSE Business Review. Available at: <https://blogs.lse.ac.uk/businessreview/2019/11/04/do-six-per-cent-of-financial-transactions-sent-via-the-swift-system-really-fail/> [Accessed 23 February 2022].
- Wirex Team. (2020). 2021: The Year of Crypto? Crypto-Friendly Currency Accounts. [online]. Available from: <https://wirexapp.com/> [Accessed February 20, 2022].
- Wirex&Stellar, 2021. The Future of Money: Cryptocurrency adoption report 2021. [online] Available at: <https://files.wirexapp.com/the-future-of-money-report.pdf> [Accessed 23 February 2022].
- Worldometer. (2022). Singapore Population (2022) - Worldometer. [online]. Available from: <https://www.worldometers.info/world-population/singapore-population/> [Accessed March 29, 2022].
- Wouters, S. (2021). How can Businesses use Stablecoins. Blockdata. [online]. Available from: <https://www.blockdata.tech/blog/general/how-can-businesses-use-stablecoins> [Accessed February 16, 2022].
- Zandt, F., 2022. Game Over for Crypto And NFTs in Games?. [online] Statista. Available at: <https://www-statista-com.manchester.idm.oclc.org/chart/26655/interest-of-video-game-studios-in-implementing-crypto-payments-and-nfts/> [Accessed 23 February 2022].
- Zmudzinski, A. (2020). DeFi Leader MakerDAO Partners With Simplex to Create a Dai Fiat On-Ramp. Bitcoin Insider. [online]. Available from: <https://www.bitcoininsider.org/article/83253/defi-leader-makerdao-partners-simplex-create-dai-fiat-ramp> [Accessed February 15, 2022].



# 14. Appendices

- Link between Bitcoin and stablecoin adoption
- Current position on adoption curve
- Established scenarios of merchant crypto payments adoption
- Our scenario of adoption



# Appendix – Project Risks

Risk	Impact	Mitigation	Status
<b>COVID-19</b>	<ul style="list-style-type: none"> <li>limitations for field work (e.g., interviews)</li> </ul>	<ul style="list-style-type: none"> <li>Do the virtual equivalent</li> </ul>	
<b>Low response rate</b>	<ul style="list-style-type: none"> <li>Cannot collect enough sample data</li> </ul>	<ul style="list-style-type: none"> <li>Use collected data and secondary research</li> <li>Follow-up by doing online/offline survey</li> </ul>	
<b>Biased response</b>	<ul style="list-style-type: none"> <li>Survey responses may not be a true reflection of the builder's merchant market</li> </ul>	<ul style="list-style-type: none"> <li>Distribute second survey to their users</li> </ul>	
<b>Less external / competitor data</b>	<ul style="list-style-type: none"> <li>Hard to analyse competitor information / strategy</li> </ul>	<ul style="list-style-type: none"> <li>Use collected data and secondary research</li> <li>Gain insights from experts</li> <li>Assume from similar industry</li> </ul>	

Legend	
	Risk is in place
	Work in progress –risk is being monitored
	No current risk – activity is done



# Appendix – Associated Consumer Risk

Comparison of current top-line consumer risks in existing systems and in digital currencies

	Value & backing risks	Depositor protection risks	Payment risks	Privacy risks	Security & technology risks	Accountability risks
Cash	Backed by central bank	N/A	Fraud and theft	High level of privacy from all parties except direct recipient (payee)	At risk of counterfeiting	Depends on issue; payee responsible for accepting legitimate cash
E-money	Reliant on depositor protection	Two-layer risks (wallet-provider and deposit-taking institution where wallet-providers deposit customer funds)	Typically protected from user error and by debit guarantees	Account-based: dependent on privacy laws of country	Relatively secure and tested	Bank and wallet-providers accountable
Commercial bank money	Same as e-money	High degree of standardized protections and regulation	Same as e-money	Same as e-money	Same as e-money	Bank accountable
Stablecoins	Variety of backing mechanisms which carry different risks <sup>15</sup>	Varied: typically no or limited depositor protections	Limited examples of protections equivalent to bank money or e-money	Varied: governance systems differ on privacy. Many institutions push privacy obligations to VASPs	Varied: audit standards still to be fully developed Varied: Counterfeiting risk in the form of double spend	Unclear
CBDC	Same as cash	N/A	Some risk depending on architecture (e.g. in "push" vs "pull" transactions)	Dependent on design & architecture (see Privacy white paper)	Dependent on design & architecture. Early pilots reveal focus on security standards and the prevention of hacking or breach <sup>16</sup> Varied: Counterfeiting risk in the form of double spend or illegitimate copying of CBDC	Central bank accountable

● High consumer risk ● Medium consumer risk ● Low consumer risk

Different ways of backing stablecoins and their potential risks

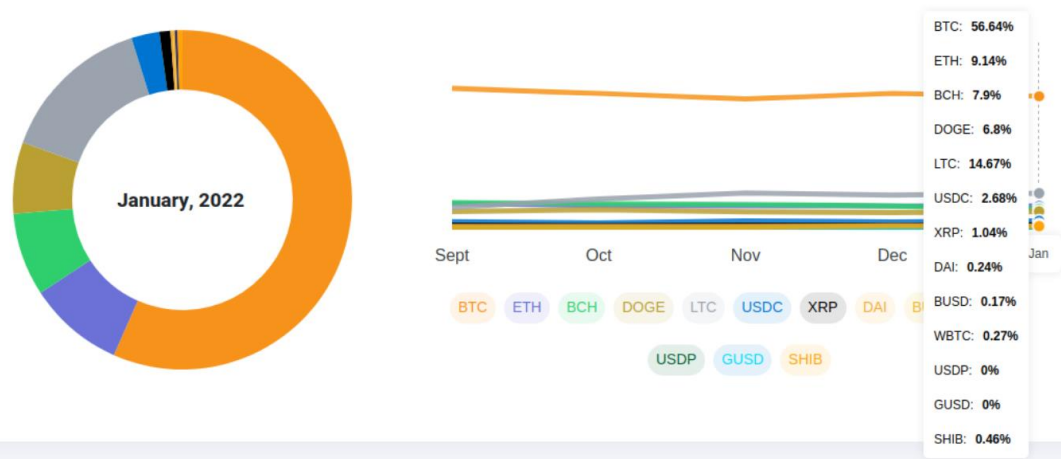
	100% backed by funds	Off-chain collateralization	On-chain collateralization	Algorithmic collateralization
Is there an accountable party if there is an issue with the backing mechanism?	Yes	Yes	No (replaced with smart contract)	No (replaced with smart contract)
Potential consumer risks	Fraud and operational risk (e.g. insufficient funds to quickly meet redemptions)  High risk and susceptible to confidence crises or a run on the stablecoin if the funds are not legitimate or sufficiently liquid	Linked to underlying collateral and dependent on whether that value is fixed or fluctuates	High risk as collateral is volatile by nature	High risk and susceptible to confidence crises or a run on the stablecoin



# Appendix – BitPay Payment Statistics

## Bitcoin is the most used crypto

BitPay Payment Count by Cryptocurrency Type



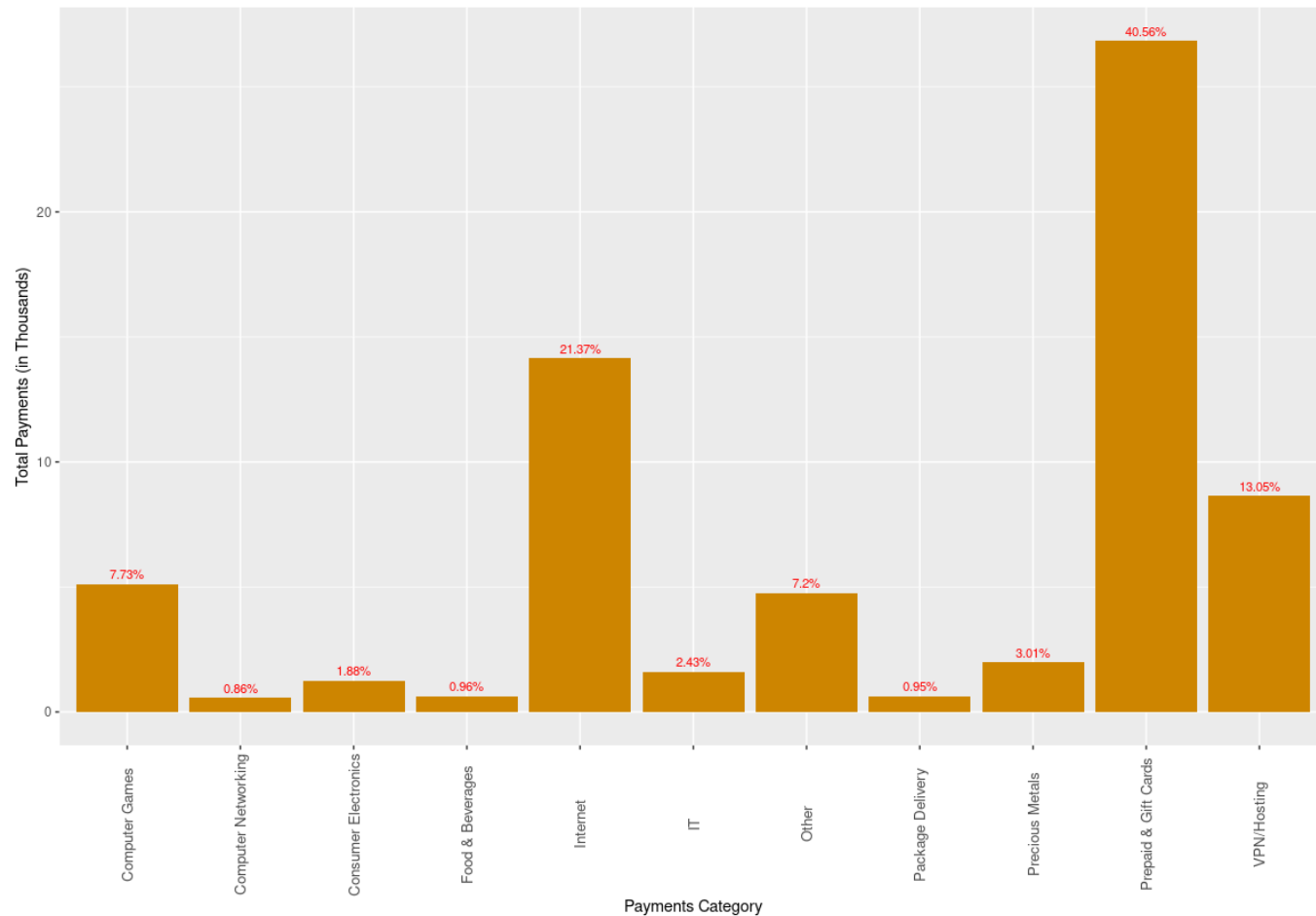
Fiat-backed USD stablecoins accounted for nearly 2,000 transactions in January 2022 alone (66,196 transactions)

USDC – 1,773 transactions (2.60%)

BUSD – 112 transactions (0.17%)

## BitPay Cryptocurrency Payments by Category

Total of 66,186 payments registered on BitPay in January 2022



(Source: BitPay 2022)

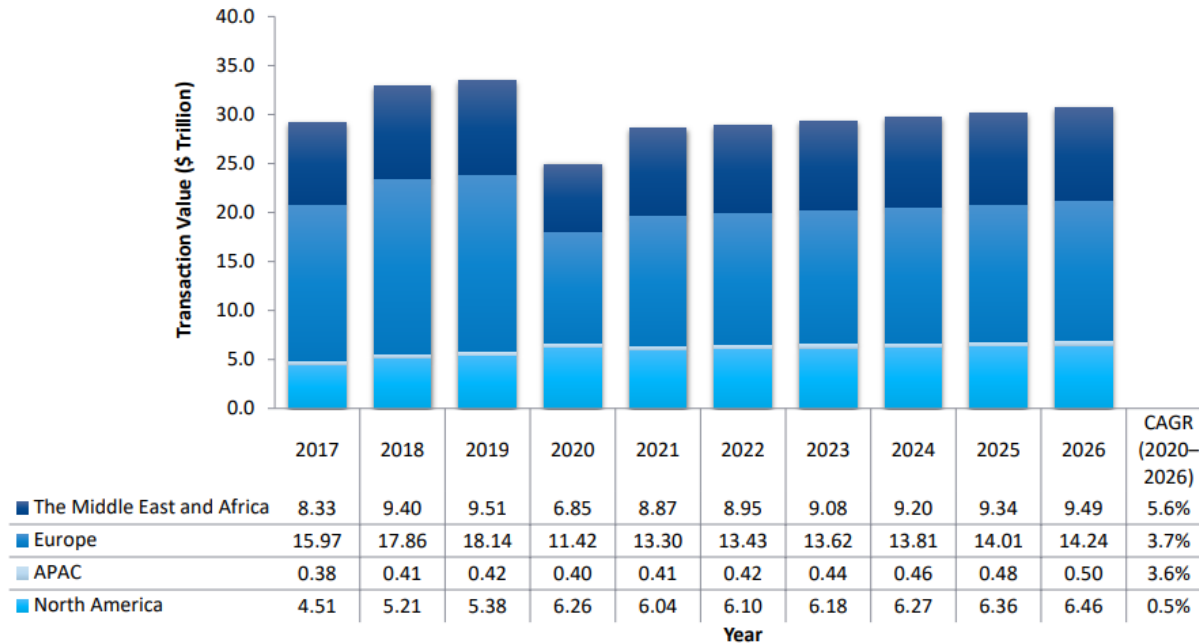


# Appendix – Cross-Border Payments & Remittances

## Market Overview:

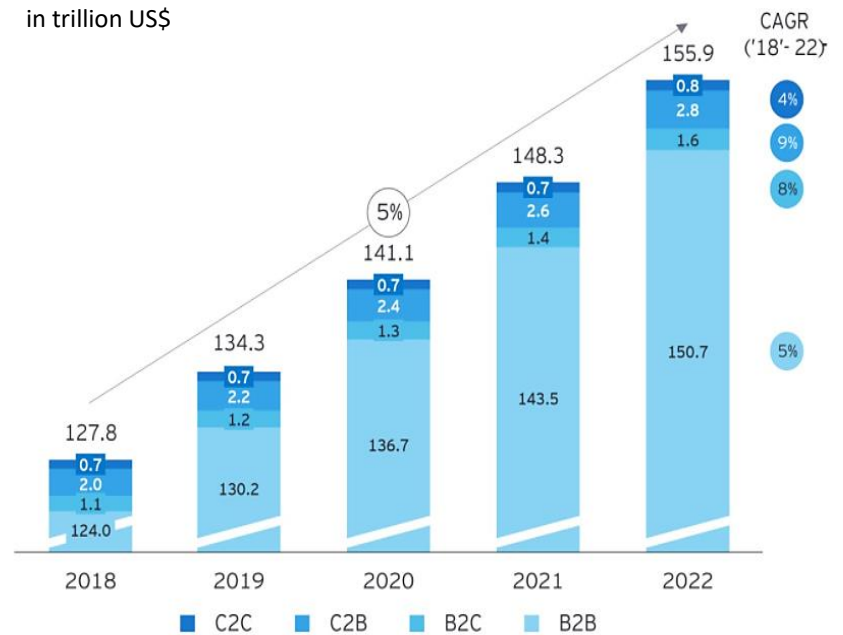
### Transaction Value Forecast by Region, Cross-border and Remittance Service Market

Cross-border and Remittance Service Market: Transaction Value Forecast by Region\*, Global, 2017–2026



\*The forecast provided is for selected key regions. The forecast for rest of the world is not available for discussion.  
Note: All figures are rounded. The base year is 2020. Source: Frost & Sullivan

### Cross-border payments by categories



Source: EY, 2021

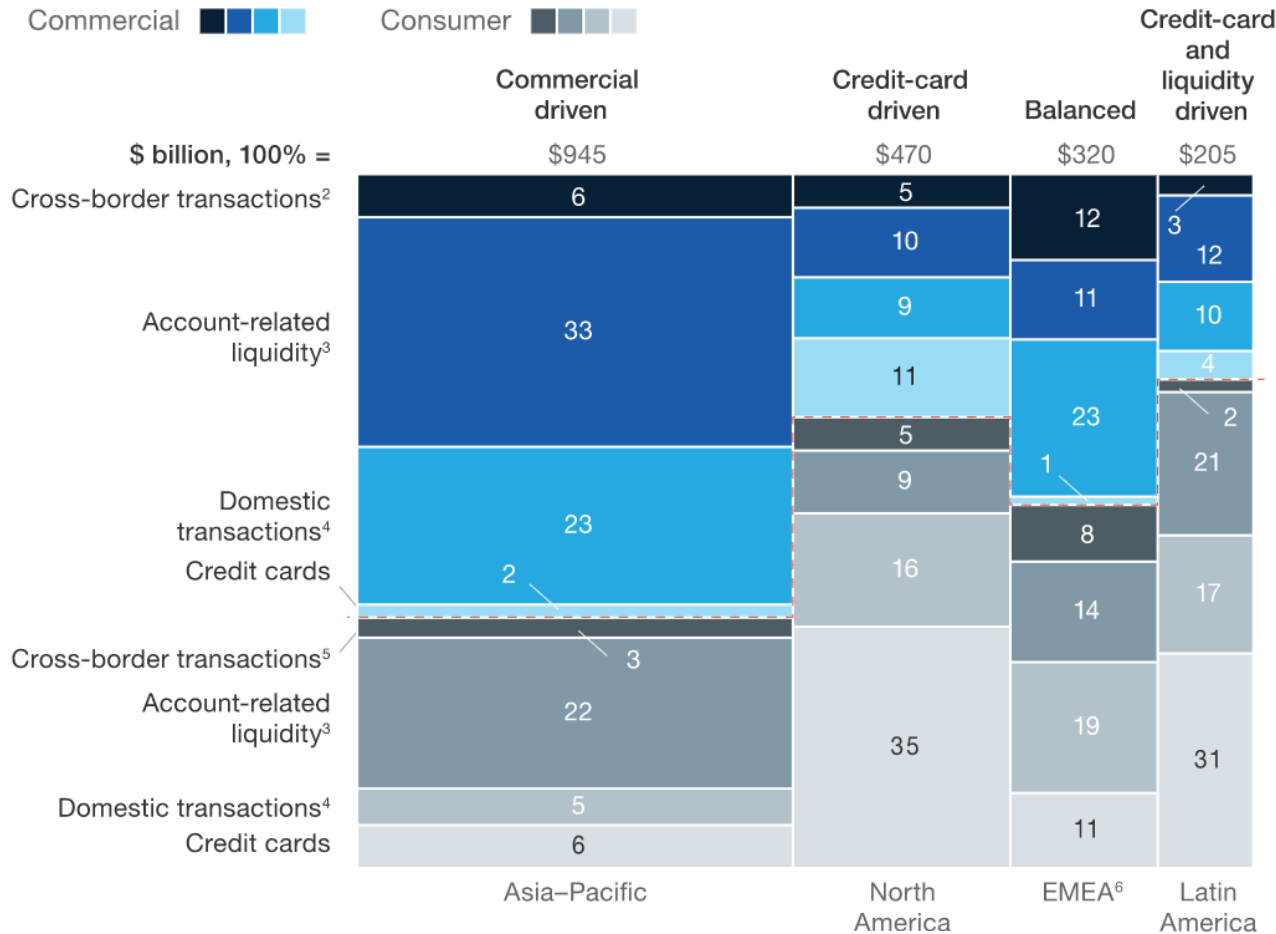
Source: Frost&Sullivan, 2021 Global Cross-border Payments and Remittance Services Growth Opportunities – August 2021



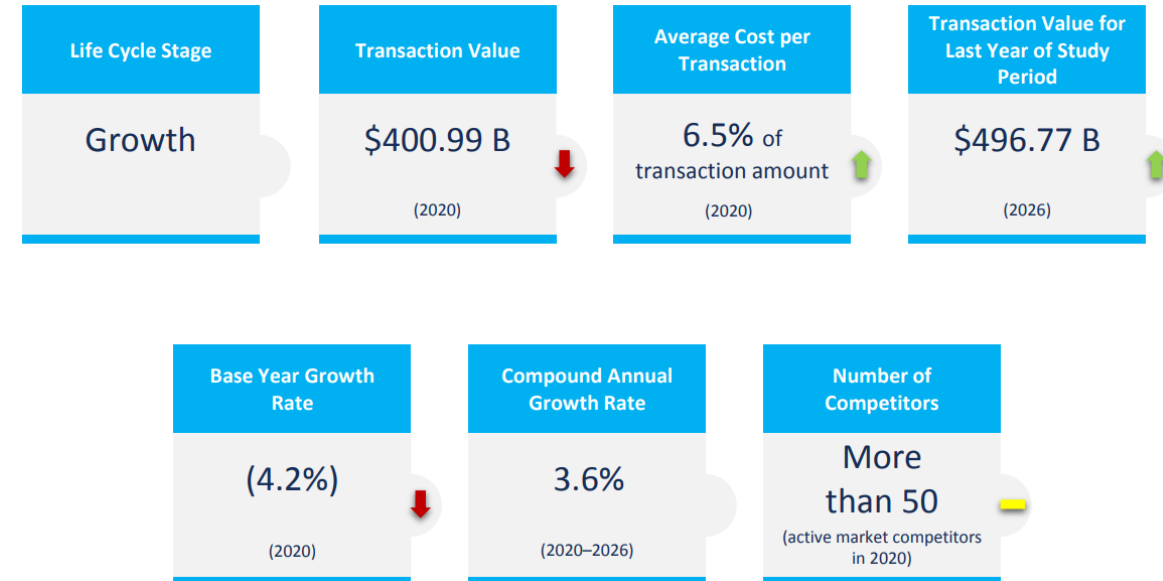
# Appendix – Cross-Border Payments & Remittances

Asia-Pacific is one of most prominent region in cross-border & remittance service market

Payments revenue, 2017, %<sup>1</sup>



Cross-border and Remittance Service Market: Key Growth Metrics, APAC, 2020



Source: Frost&Sullivan, 2021 (Digitalization and Data Analytics are Driving Asia-Pacific Cross-border and Remittance Service Market Growth, April 2021)

<sup>1</sup>Figures may not sum to 100%, because of rounding.

<sup>2</sup>Trade finance and cross-border payments services (B2B, B2C).

<sup>3</sup>Net interest income on current accounts and overdrafts.

<sup>4</sup>Fee revenue on domestic payments transactions and account maintenance (excluding credit cards).

<sup>5</sup>Remittance services and C2B cross-border payments services.

<sup>6</sup>Europe, Middle East, and Africa.



# Appendix – Cross-Border Payments & Remittances

## Competitive Environment, Cross-border and Remittance Service Market

Cross-border and Remittance Service Market: Competitive Environment, Global, 2020

Number of Competitors	Over 100 with revenue greater than \$1.00 million
Competitive Factors	Cost, transaction performance, strong remittance corridor preference, agent payout network, merchant acceptance base, high-volume transaction, robust payment infrastructure, seamless integration, customer relationships, regulatory compliance, and licenses
Key End-user Industry Verticals	Mass-customer, eCommerce, financial services, retail, travel
Leading Competitors	PayPal, Western Union, Alipay, Tencent, Mastercard, Visa, Euronet Worldwide, FIS
Other Notable Competitors	Paysafe, Finabl, Stripe, Revolut, Ripple
Distribution Structure	Digital channel, distribution and partnerships agreement, retail sales, direct sales, business contracts
Notable Acquisitions and Mergers	FIS acquired Worldpay, Mastercard acquired Transfast, Visa acquired Earthport, Euronet acquired ePay, IME, and xe Corp

Global	Asia-Pacific	Europe	North America	Africa and the Middle East
<ul style="list-style-type: none"> <li>• Euronet Worldwide</li> <li>• Moneygram</li> <li>• Western Union</li> <li>• WorldRemit</li> <li>• Mastercard</li> <li>• Worldline</li> <li>• Ria Financial</li> <li>• ACI Worldwide</li> <li>• Discover</li> <li>• Visa</li> <li>• UnionPay</li> <li>• PayPal</li> <li>• Alipay</li> <li>• WeChat Pay</li> </ul>	<ul style="list-style-type: none"> <li>• Gcash</li> <li>• GrabPay</li> <li>• Nium</li> <li>• Trango</li> <li>• Flyremit</li> <li>• BigPay</li> <li>• TNG Wallet</li> <li>• Coins.Ph</li> <li>• Orbit Remit</li> <li>• Merchantrade</li> <li>• EMQ</li> <li>• Sing X</li> <li>• Paytm</li> <li>• Airwallex</li> </ul>	<ul style="list-style-type: none"> <li>• Xoom</li> <li>• Llyods Bank</li> <li>• BNP Paribas</li> <li>• HSBC</li> <li>• Wise</li> <li>• Revolut</li> <li>• Azimo</li> <li>• Argentex</li> <li>• Checkout</li> <li>• EQPay</li> <li>• Global Reach</li> <li>• Foreign Currency Direct</li> <li>• Starling Bank</li> </ul>	<ul style="list-style-type: none"> <li>• Ripple</li> <li>• Remitly</li> <li>• World Remit</li> <li>• Telcoin</li> <li>• Via Americas</li> <li>• Stripe</li> <li>• Fleetcor</li> <li>• Bill.com</li> <li>• CXI</li> <li>• FIS Worldpay</li> <li>• Fiserv First Data</li> <li>• Intermex</li> </ul>	<ul style="list-style-type: none"> <li>• Bidvest Bank</li> <li>• Absa</li> <li>• Capitec</li> <li>• Hello Paisa</li> <li>• Pick N Pay</li> <li>• M-Pesa</li> <li>• Dahabshiil</li> <li>• GCC Exchange</li> <li>• UAE Exchange</li> </ul>

Source: Frost&Sullivan, 2021 (Global Cross-border Payments and Remittance Services Growth Opportunities – August 2021)

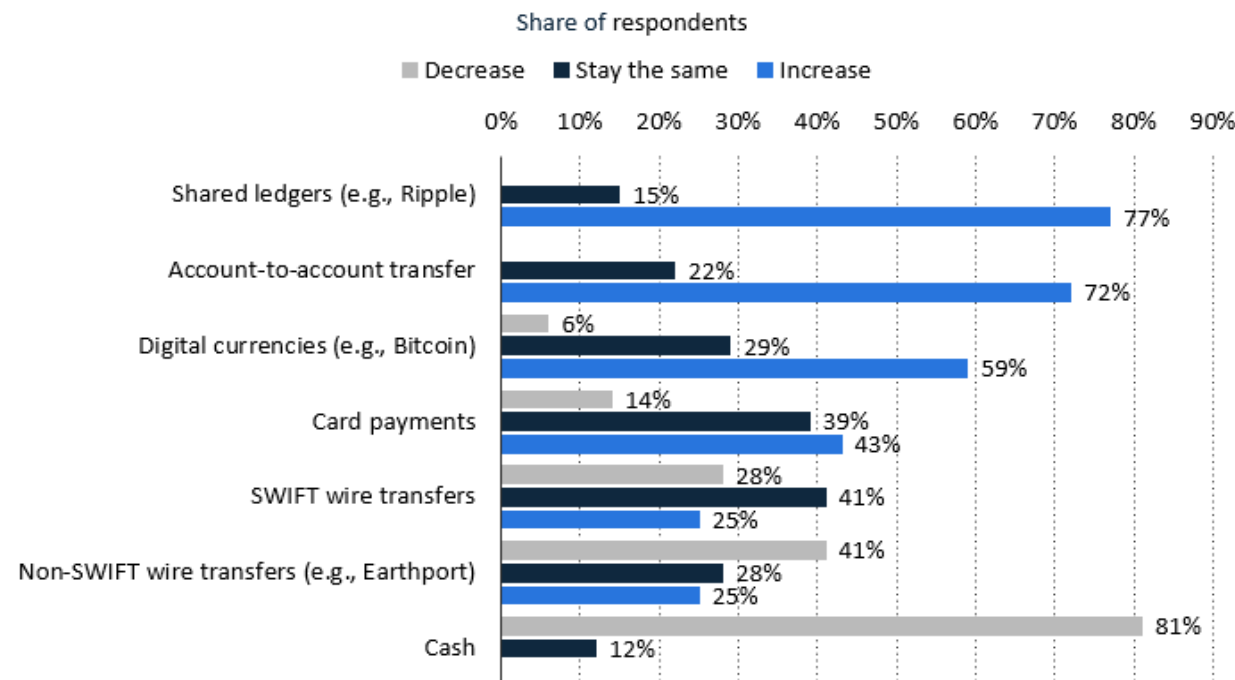


# Appendix – Cross-Border Payments & Remittances

## Cost components of sending a cross-border remittance through stablecoins

Any on-ramp fees (e.g. from agents, banks, credit cards etc.) necessary for moving fiat money (digital or physical) onto an exchange or other service that enables the purchase of stablecoins	
+	Potential exchange cost for converting starting fiat currency to stablecoin <i>(only relevant if stablecoin is denominated in another currency)</i>
+	Network or service-provider transaction fee
+	Potential exchange cost for converting stablecoin to recipient's fiat currency <i>(only relevant if stablecoin is denominated in another currency)</i>
+	Any off-ramp fees that may be necessary for moving funds from the exchange or other service into fiat money (digital or physical) that can be readily spent in the economy <i>(this could be lessened if stablecoins obtained wide use, including with merchants)</i>
=	Total cost of sending a remittance through stablecoins

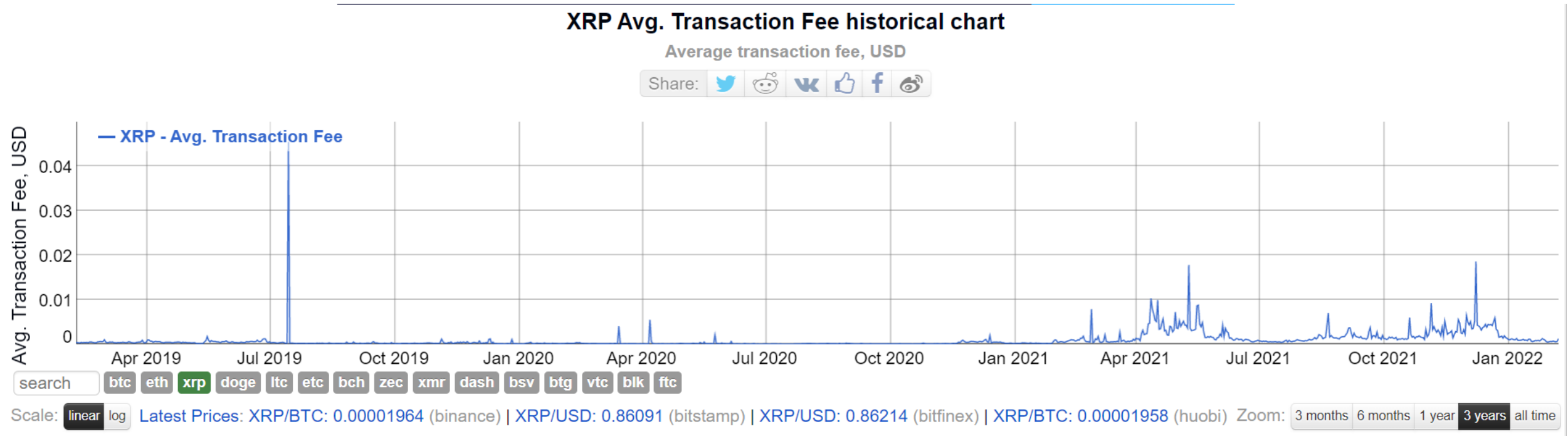
Source: WEF, 2021 Available at:  
[https://www3.weforum.org/docs/WEF\\_Value\\_Proposition\\_of\\_Stablecoins\\_for\\_Financial\\_Inclusion\\_2021.pdf](https://www3.weforum.org/docs/WEF_Value_Proposition_of_Stablecoins_for_Financial_Inclusion_2021.pdf)



Source: Statista, 2017



# Appendix – Ripple

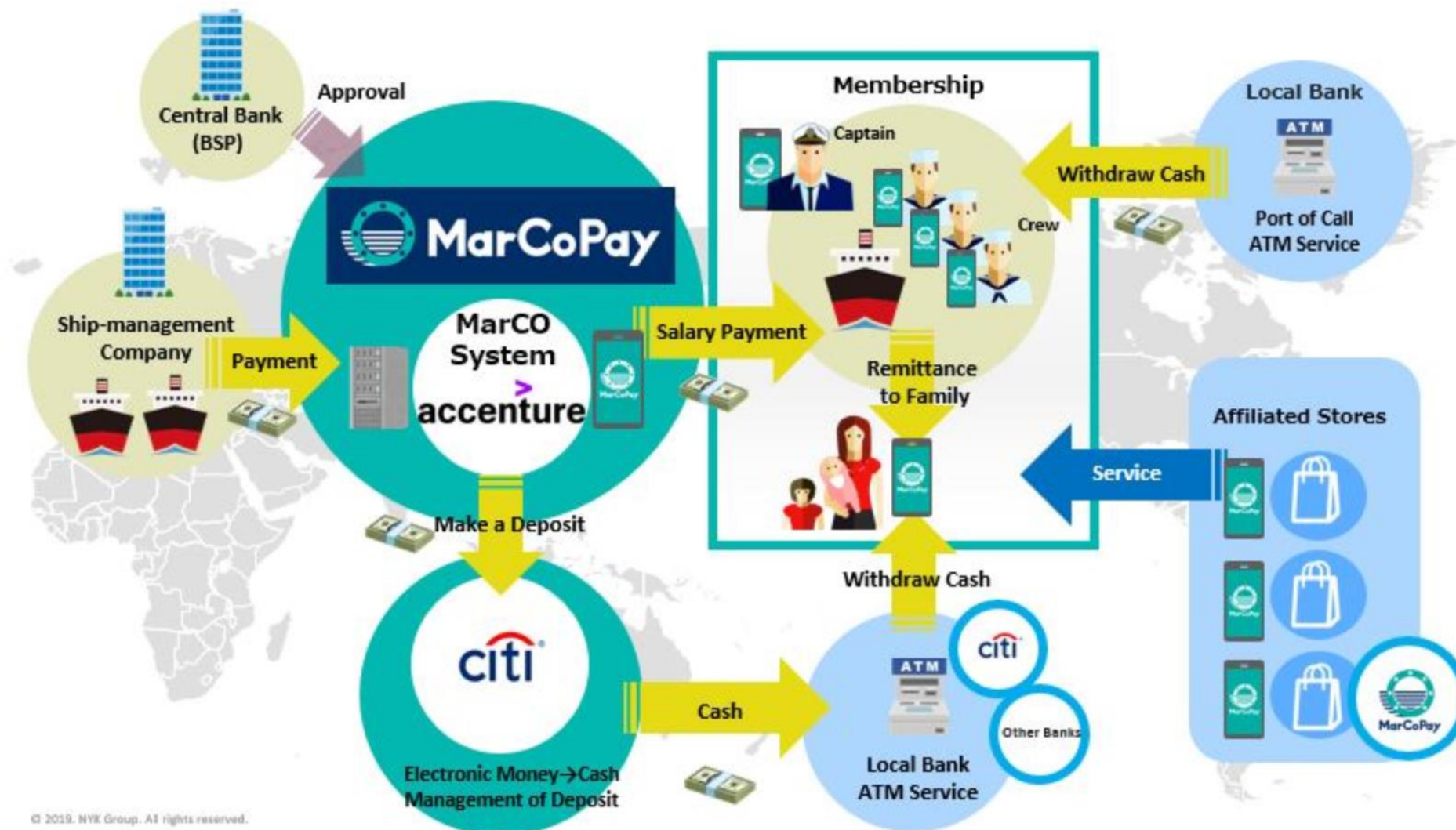


Source: <https://bitinfocharts.com/comparison/xrp-transactionfees.html#3y>



# Appendix – MarCoPay

MarCoPay is an electronic money platform designed mainly for seafarers hired outside Japan to make digital settlements with QR codes, international remittances and withdraw cash on a smartphone app.





# Appendix – Trends in retail transactions market



- BitPay found that Ether accounted for 15% of all payments made on BitPay's platform in 2021, and **13% were made using stablecoins**. Bitcoin's share of payments **downed from 92% in 2020 to about 65%**

(Source: INSIDER INTELLIGENCE, 2022)



- 24% of small businesses surveyed across 9 countries plan to accept crypto payments
- 75% said adding new forms of payment was "fundamental to their business growth"

(Source: The Visa Back to Business Study 2021 Outlook, 2021)

## US Adults' Interest in Using Cryptocurrencies in Select Ways, by Ownership Status, Feb 2021

% of respondents in each group



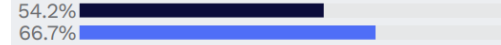
Note: owners n=1,376; non-owners n=3,072; respondents were "very" or "extremely" interested  
Source: PYMNTS.com, "Cryptocurrency Payments Playbook: Cryptocurrencies Gain Momentum As A Payment Option" in collaboration with Bitpay, July 22, 2021

(Source: INSIDER INTELLIGENCE, 2022)

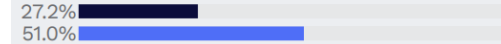
- Around 60% of Owners want to make online purchases if that are more private or secure or if these payments are automatically available at checkout, more than 20% non-owners as well

## Cryptocurrency owners' and nonowners' opinions of how merchants handle cryptocurrency

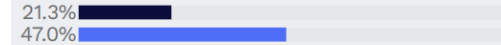
Consumers' opinion of how merchants handle cryptocurrency, by ownership status  
Not enough merchants accept cryptocurrency.



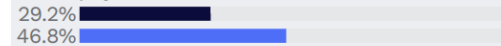
I am more likely to purchase from a merchant that takes cryptocurrency.



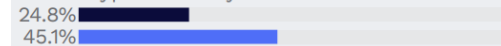
I seek out merchants that accept cryptocurrency to make purchases.



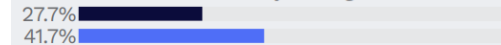
I am likely to spend more if I am using cryptocurrency than if I use other payment methods, such as a credit card.



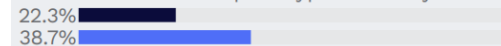
I trust merchants that accept cryptocurrency more than those that do not.



Merchants that accept cryptocurrency do not make it easy enough to use.



I will only make the purchase if the merchant accepts cryptocurrency.



I am unlikely to make large purchases at merchants that do not take cryptocurrency.



■ Nonowners  
■ Owners

(Source: Cryptocurrency Payments Report, 2021)

## Cryptocurrency acceptance will drive new sales for merchants.

- 51% of cryptocurrency owners are more likely to buy from merchants that accept cryptocurrency, and 47% of them seek out merchants that accept cryptocurrency to make purchases
- 59% of non-owners would be interested in purchasing at least one product using cryptocurrency

(Cryptocurrency Payments Report, 2021)



**Large retailers looking to issue stablecoins**  
Walmart, Amazon looking to launch own cryptocurrencies to allow seamless payments.

(INSIDER INTELLIGENCE, 2022)



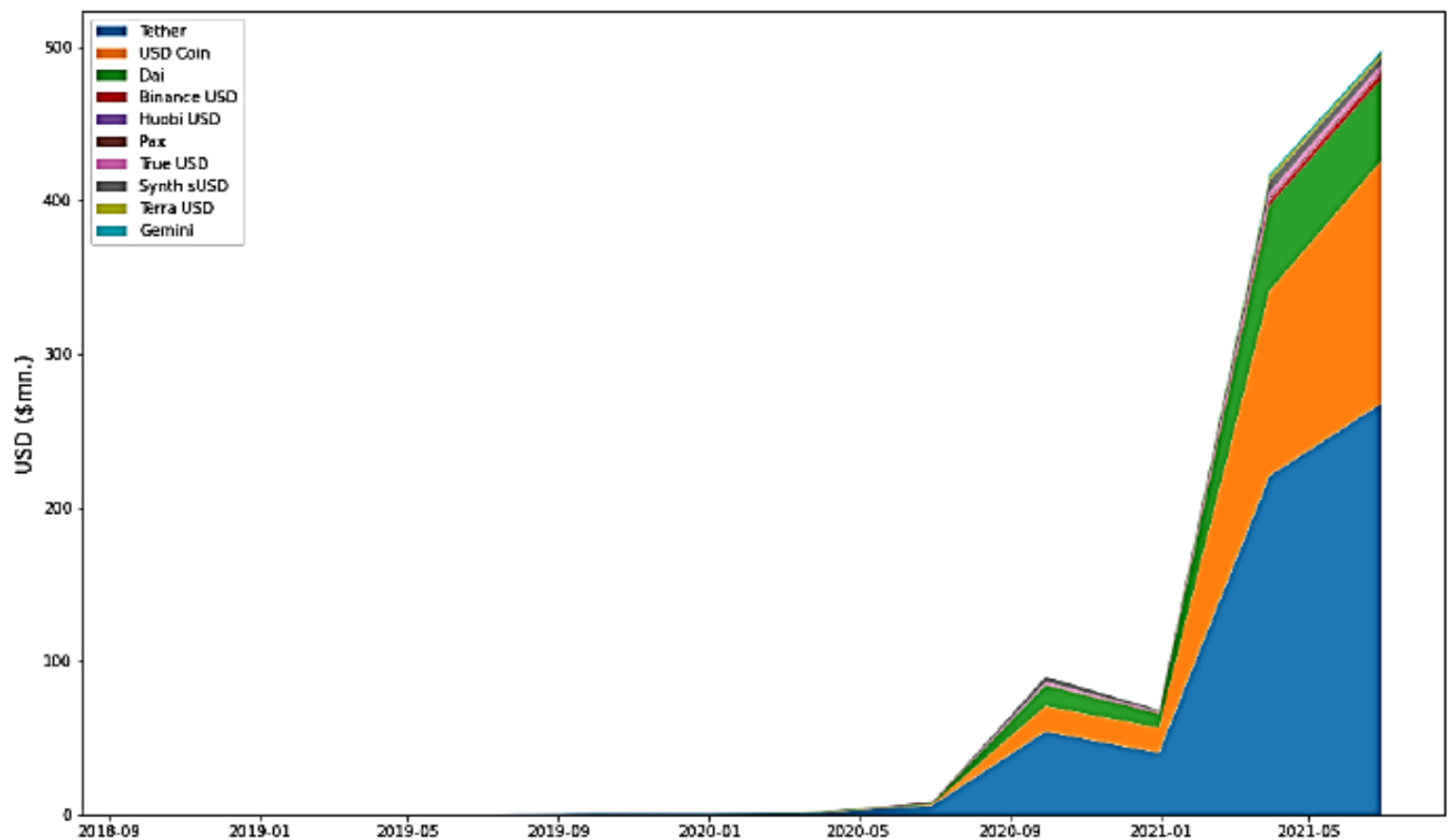
Amazon-Owned Whole Foods have started accepting Bitcoin.

(CCN, 2019)



# Appendix – Historic trend of Top Stablecoin Gas Fees

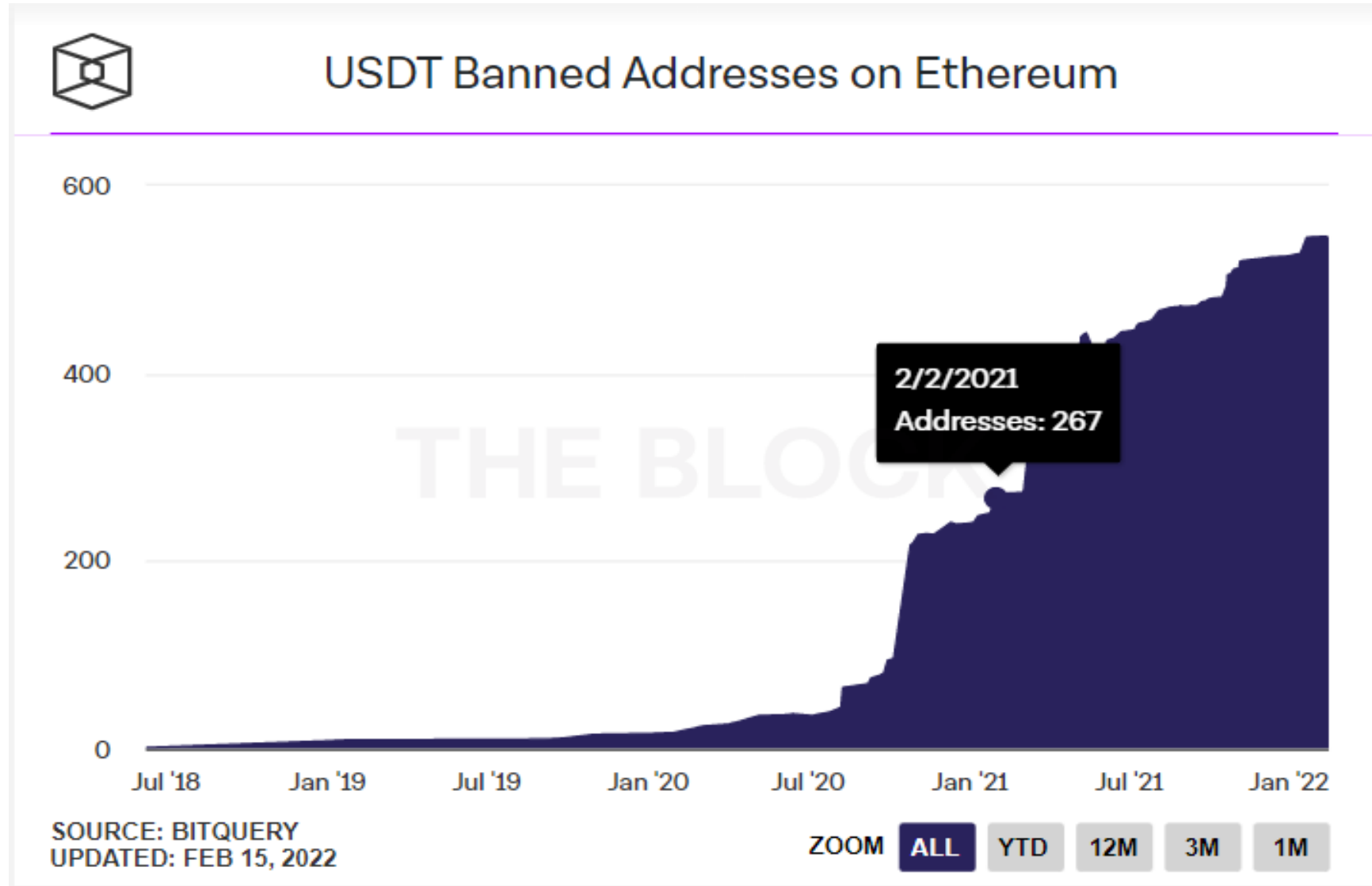
Figure 10: Quarterly Transaction Fees for Top Stablecoins



Source: Mizrach & Bruce, 2021



# Appendix – USDT Banned Addresses



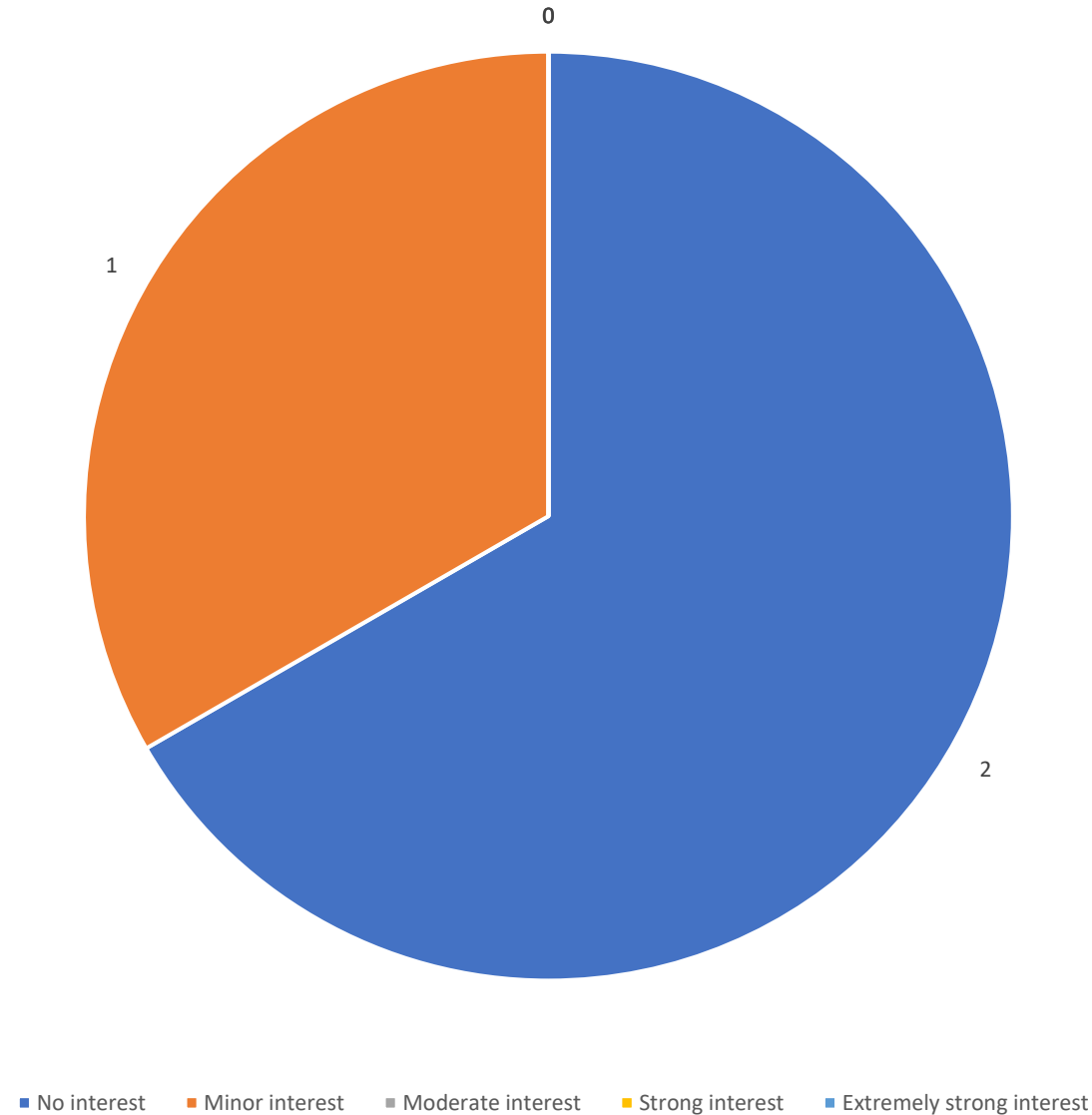
Source: <https://www.theblockcrypto.com/data/decentralized-finance/stablecoins>



# Appendix – Additional Qualtrics Graphs

What is your level of interest in learning more about cryptocurrencies, including stablecoins?

*Level of interest in learning more about cryptocurrencies among those who HAVE NOT heard of the term before*

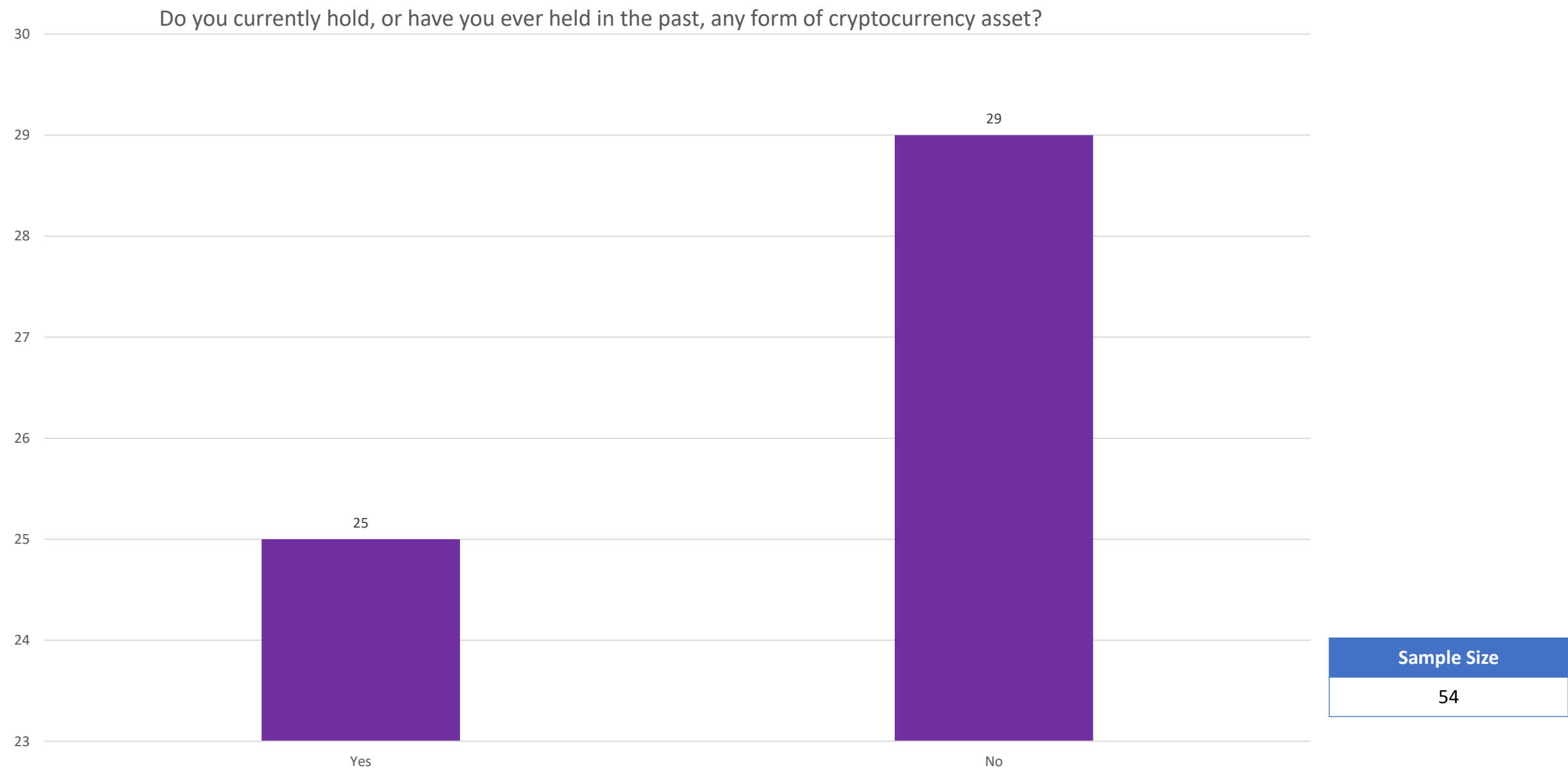


Sample Size

3



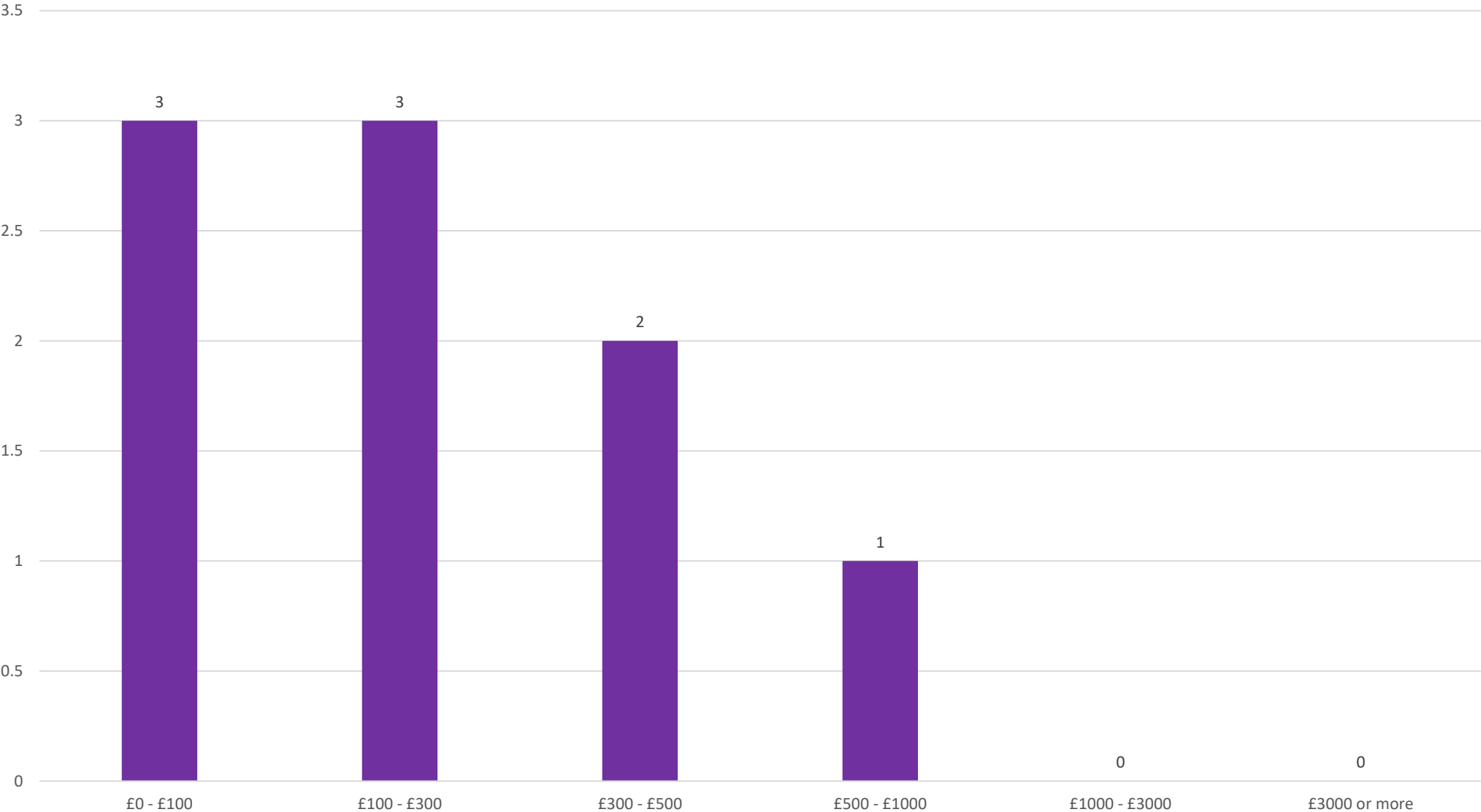
# Appendix – Additional Qualtrics Graphs





# Appendix – Additional Qualtrics Graphs

Please indicate the AVERAGE approximate amount of your cryptocurrency transactions, of any kind, in GBP equivalent:

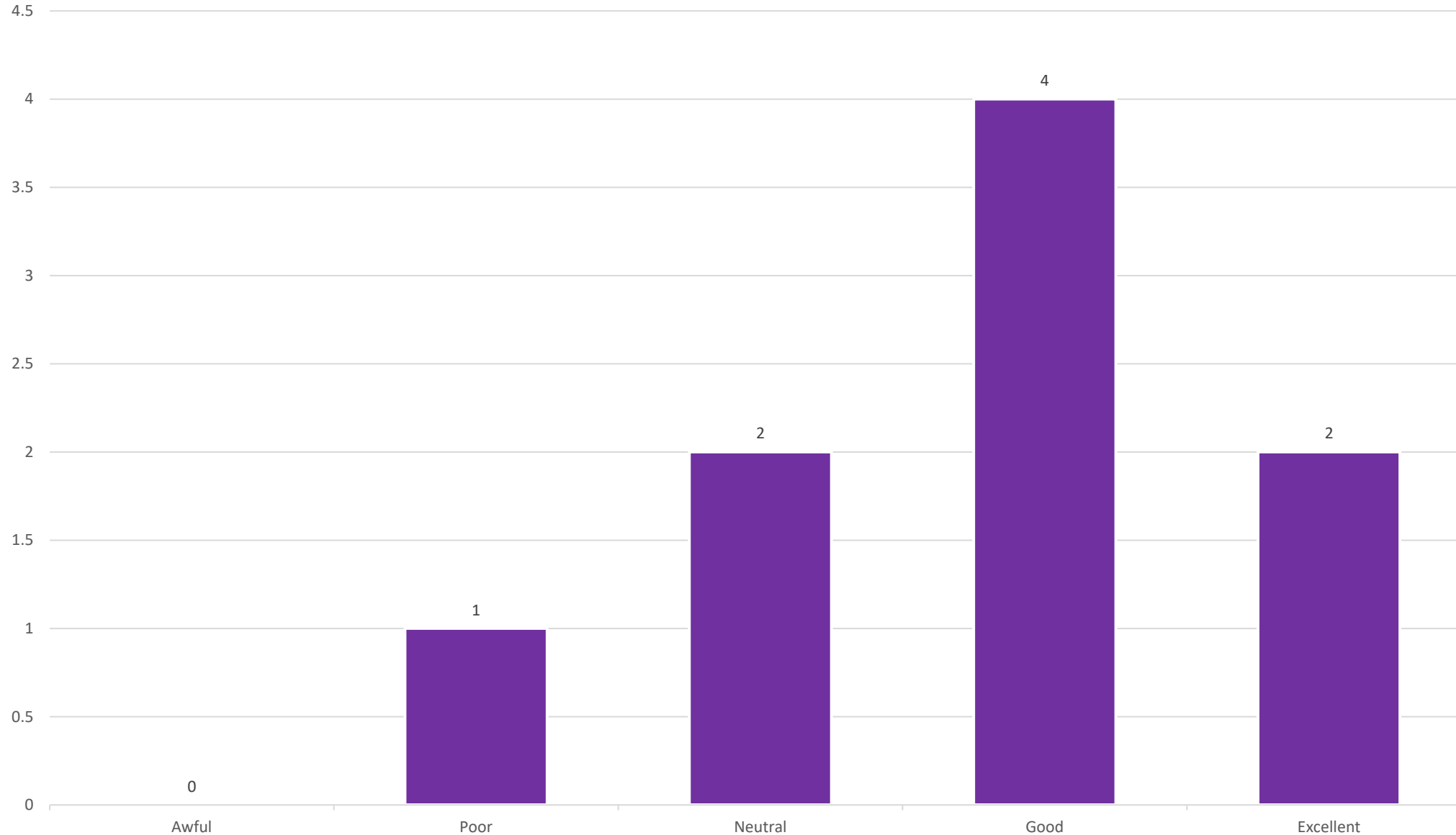


Sample Size
9



# Appendix – Additional Qualtrics Graphs

What was your experience like when conducting a transaction with cryptocurrency?



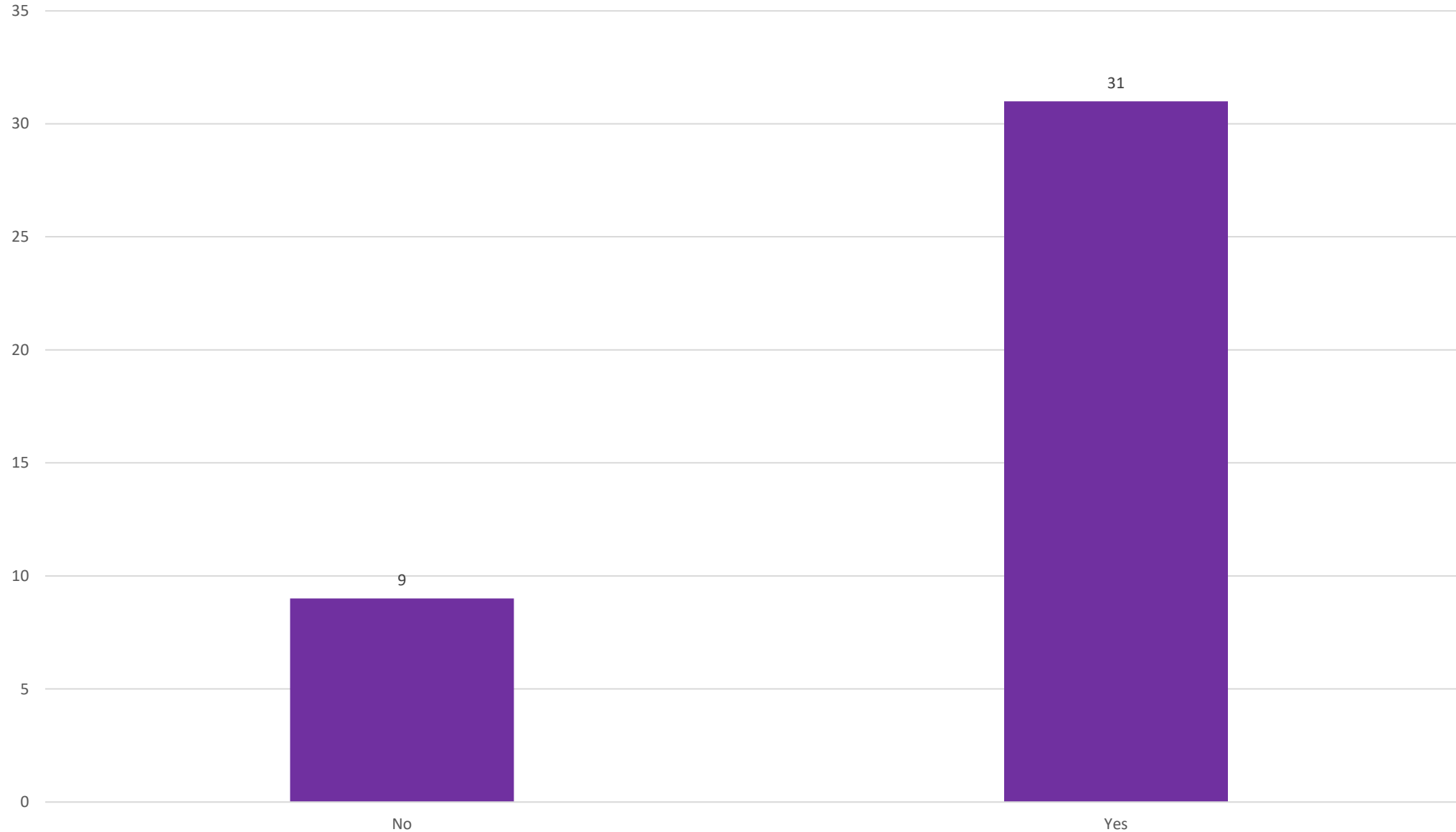
Sample Size

9



# Appendix – Additional Qualtrics Graphs

Do you believe that stablecoins are a viable alternative to more traditional payment methods?



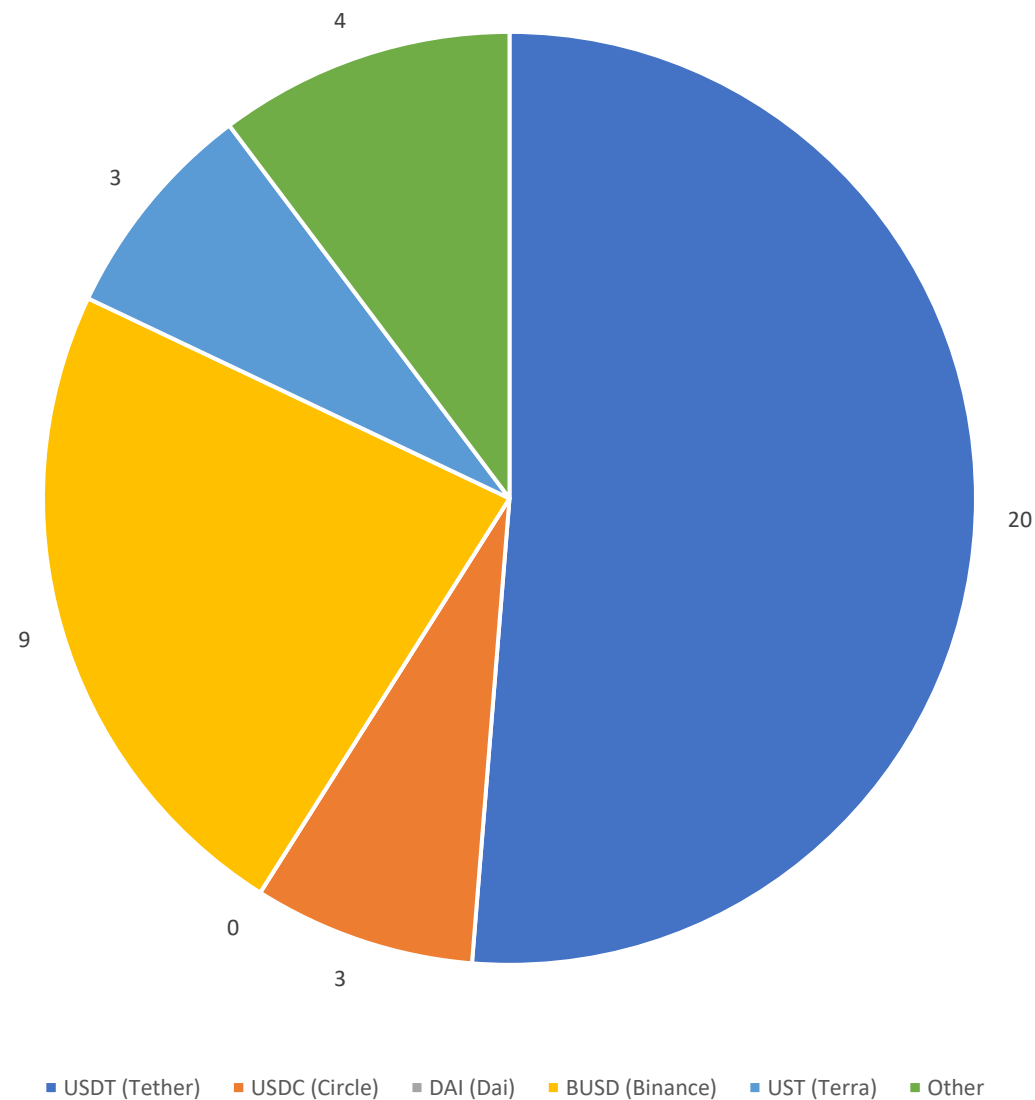
Sample Size

40



# Appendix – Additional Qualtrics Graphs

Which stablecoin would you be most likely to use?

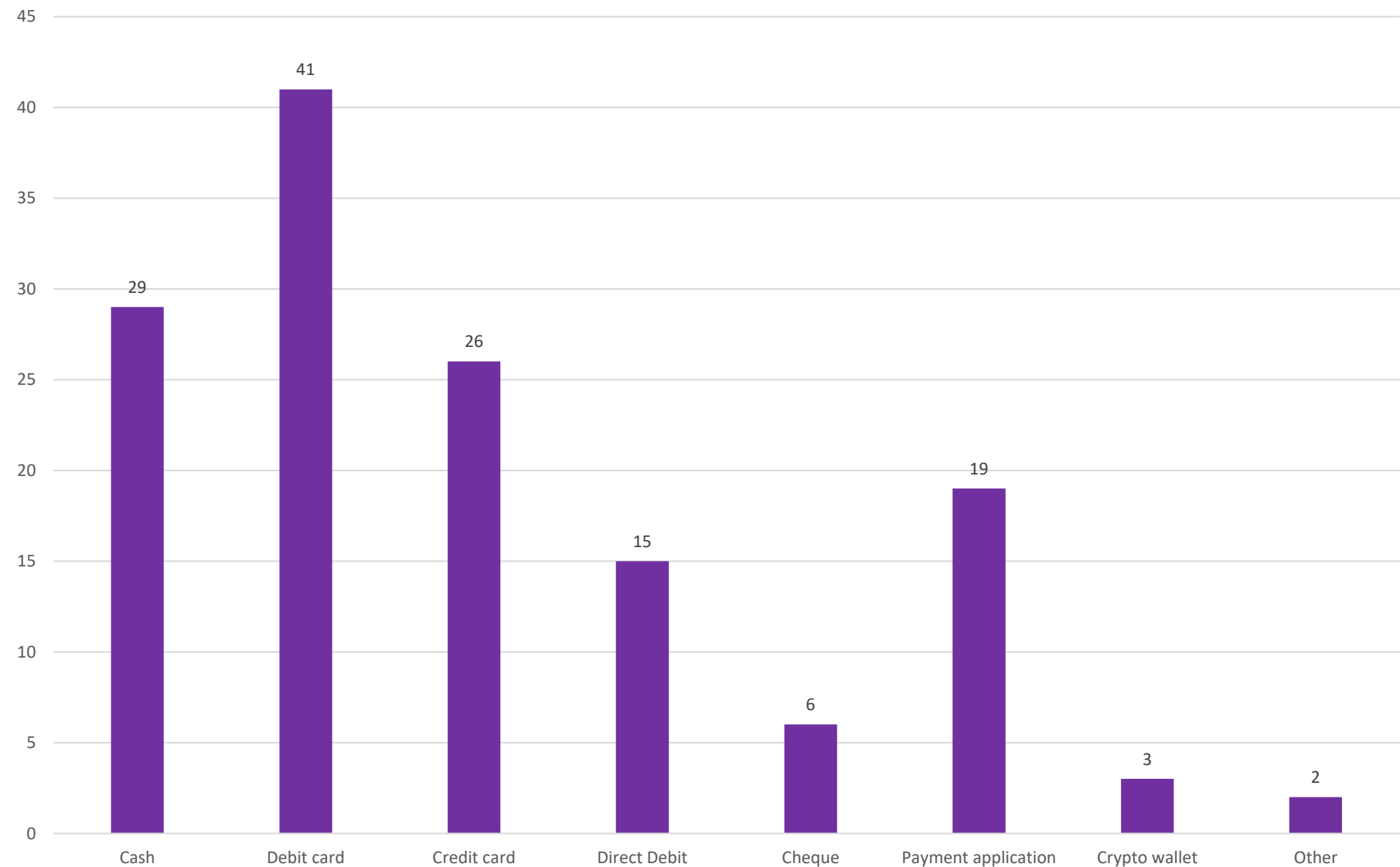


Sample Size
39



# Appendix – Additional Qualtrics Graphs

Do you use any of the following payment methods on a daily basis?  
Please select ALL that apply:

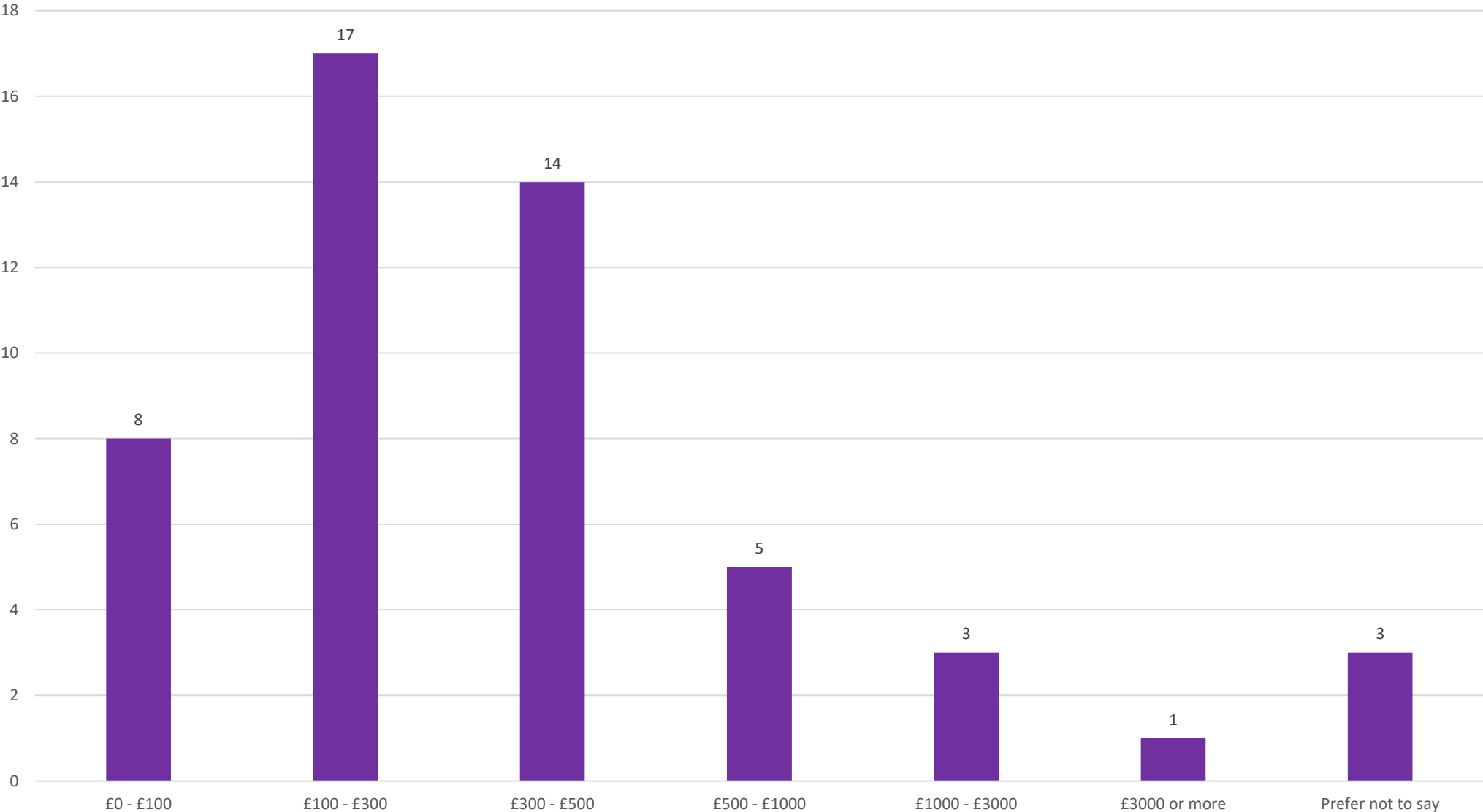


Sample Size (Respondents)	Number of responses (Multiple answers)
57	141



# Appendix – Additional Qualtrics Graphs

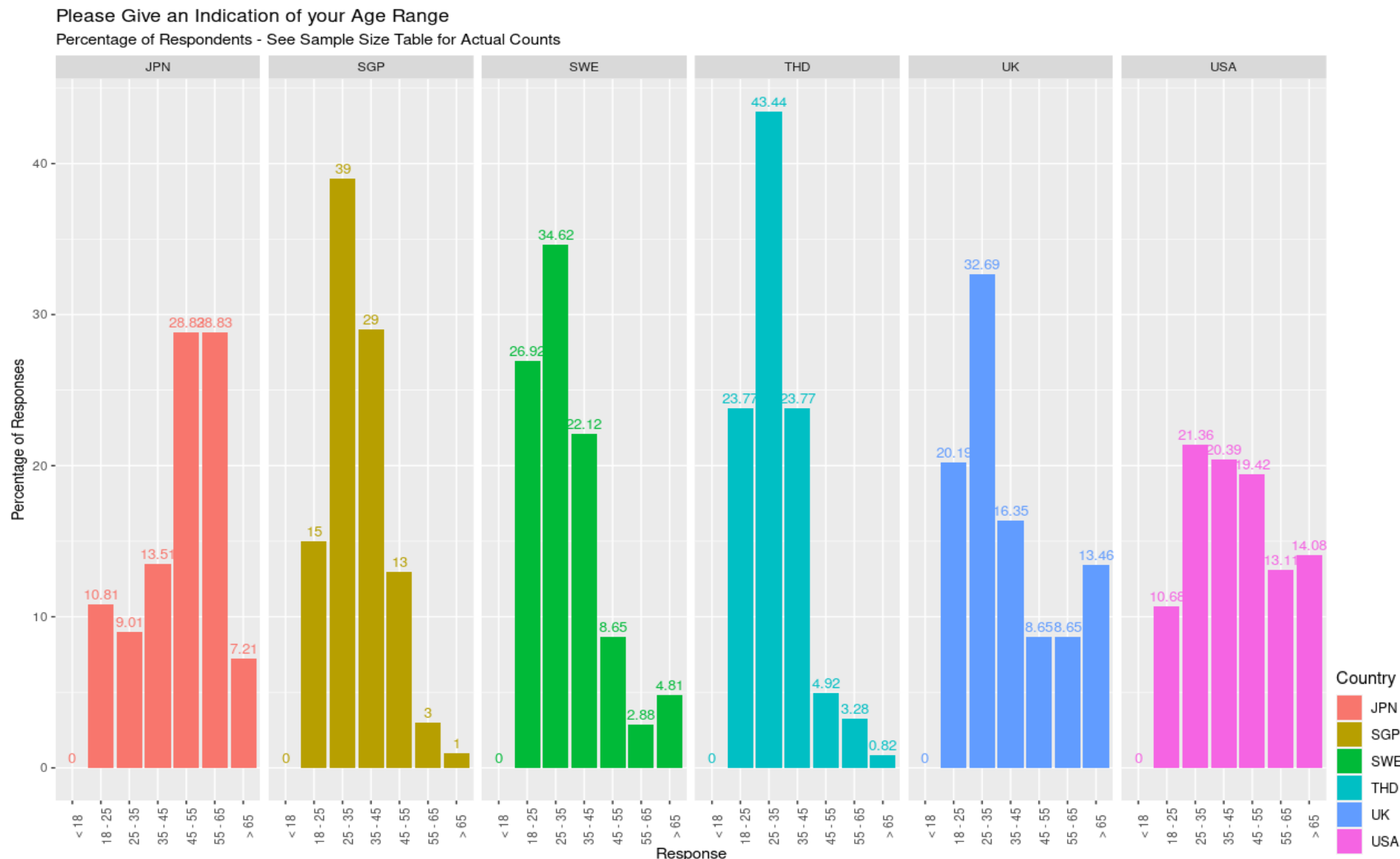
Approximately how much, on average, do you spend using ALL payment methods, on a WEEKLY basis, excluding large expenses such as rent or utilities?



Sample Size
51



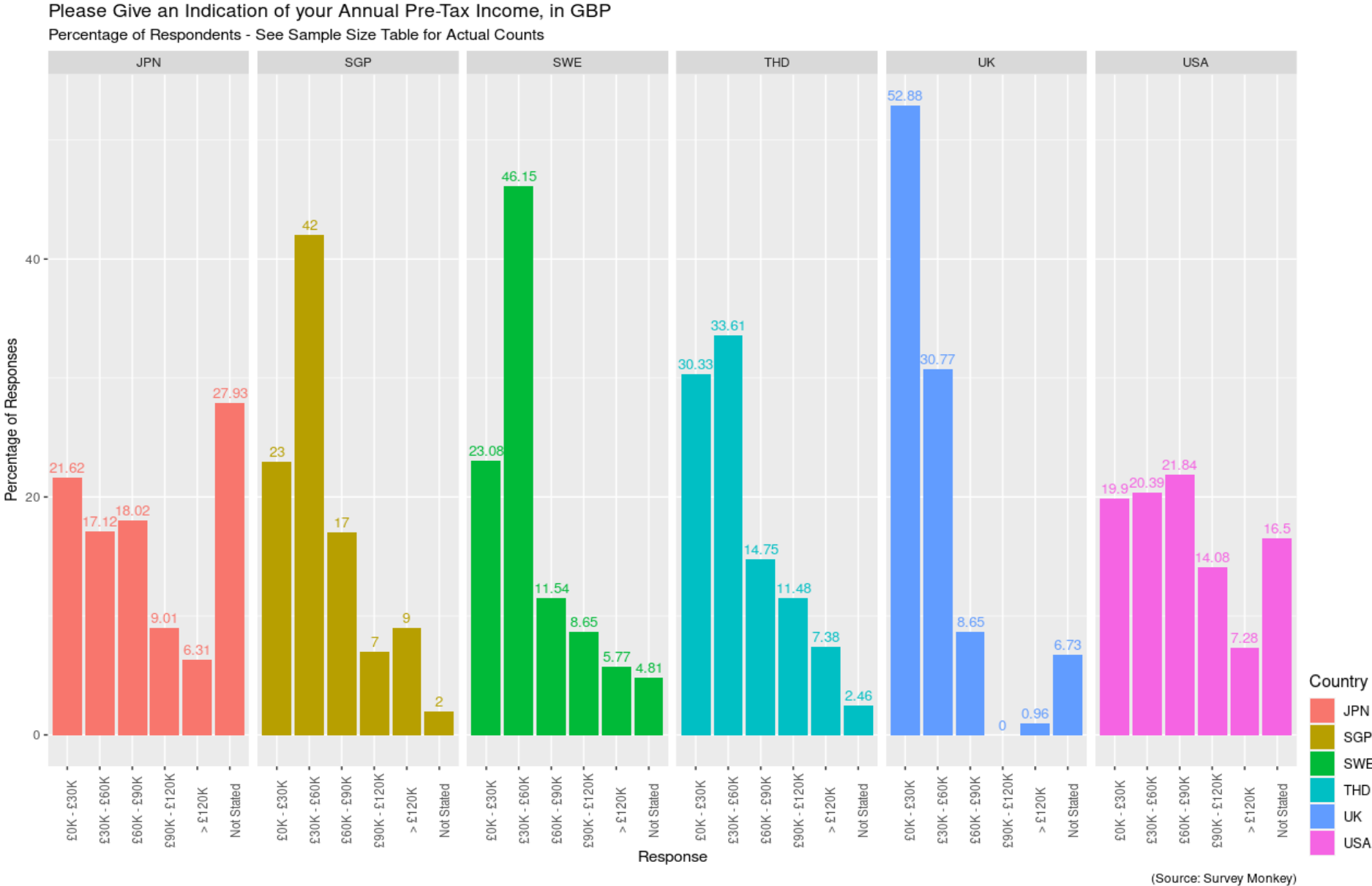
# Appendix – Additional SurveyMonkey Graphs



(Source: Survey Monkey)



# Appendix – Additional SurveyMonkey Graphs



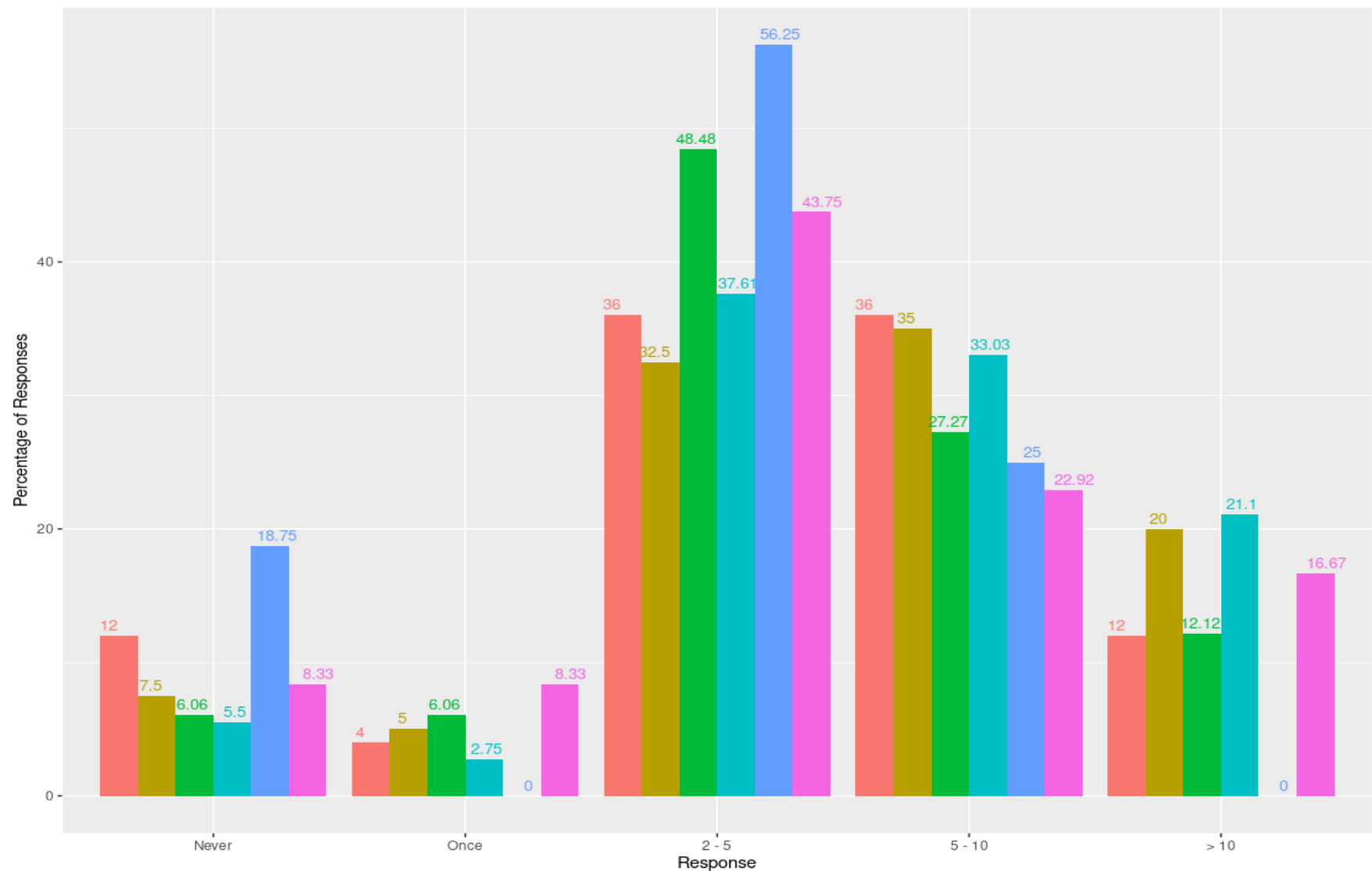
Country	Sample Size
Japan	111
Singapore	100
Sweden	104
Thailand	122
UK	104
USA	206



# Appendix – Additional SurveyMonkey Graphs

Can You Please Indicate How Many Times you Have Used Cryptocurrencies in the Past 12 Months?

Percentage of Respondents - See Sample Size Table for Actual Counts



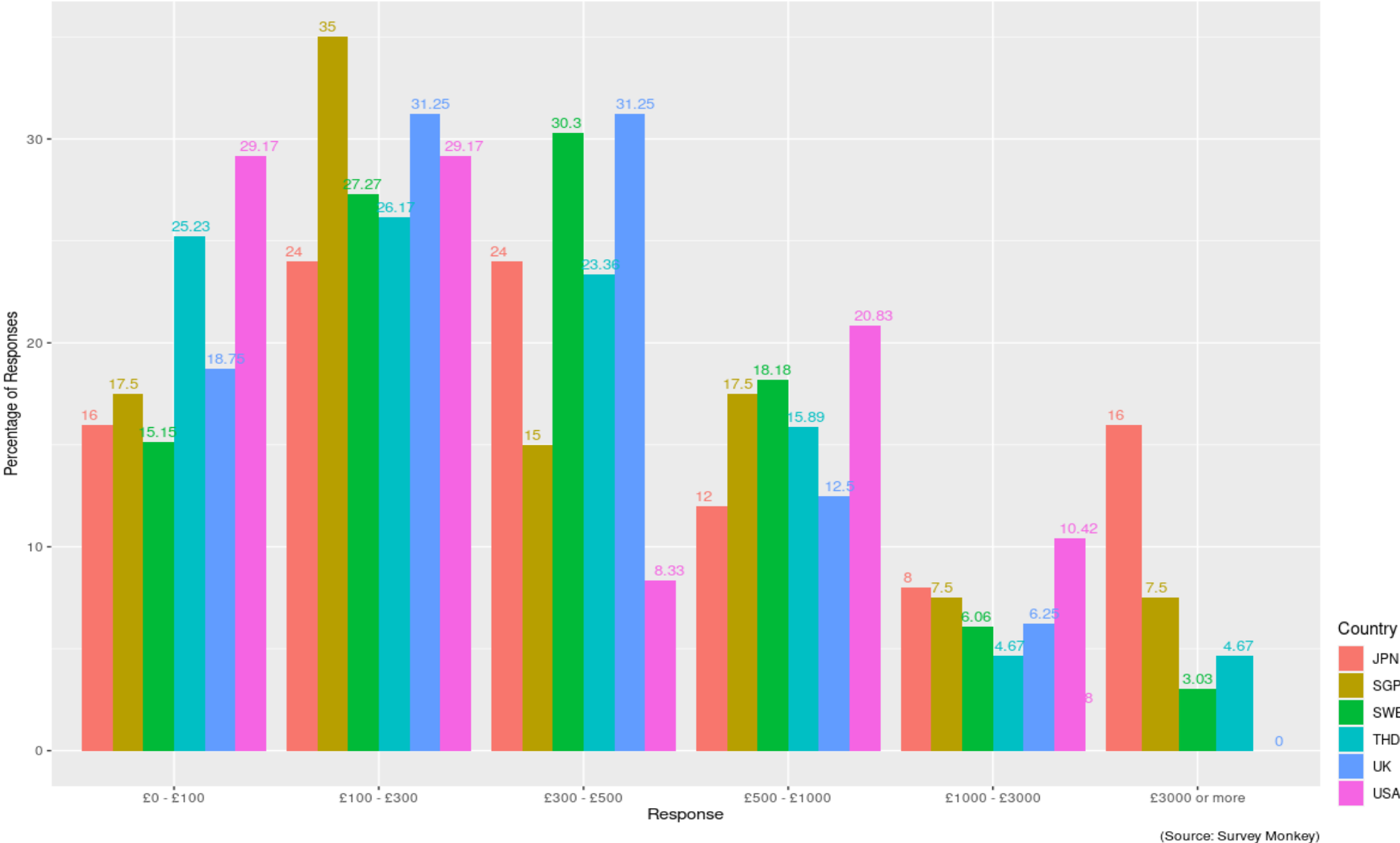
(Source: Survey Monkey)

Country	Sample Size
Japan	25
Singapore	40
Sweden	33
Thailand	109
UK	16
USA	48



# Appendix – Additional SurveyMonkey Graphs

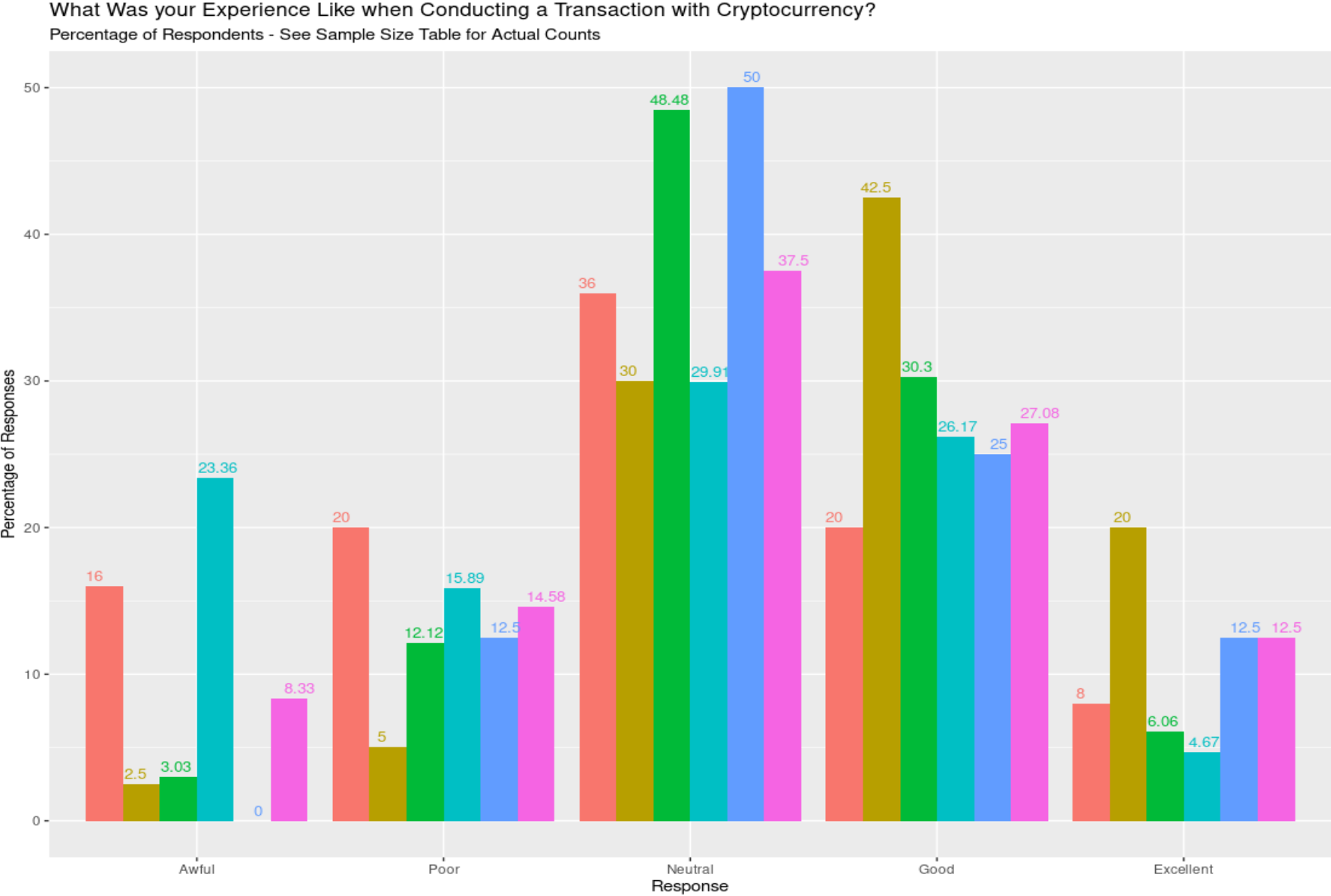
Please Indicate the AVERAGE Approximate Amount of your Cryptocurrency Transactions, of any Kind, in GBP Equivalent  
Percentage of Respondents - See Sample Size Table for Actual Counts



Country	Sample Size
Japan	25
Singapore	40
Sweden	33
Thailand	109
UK	16
USA	48



# Appendix – Additional SurveyMonkey Graphs



(Source: Survey Monkey)

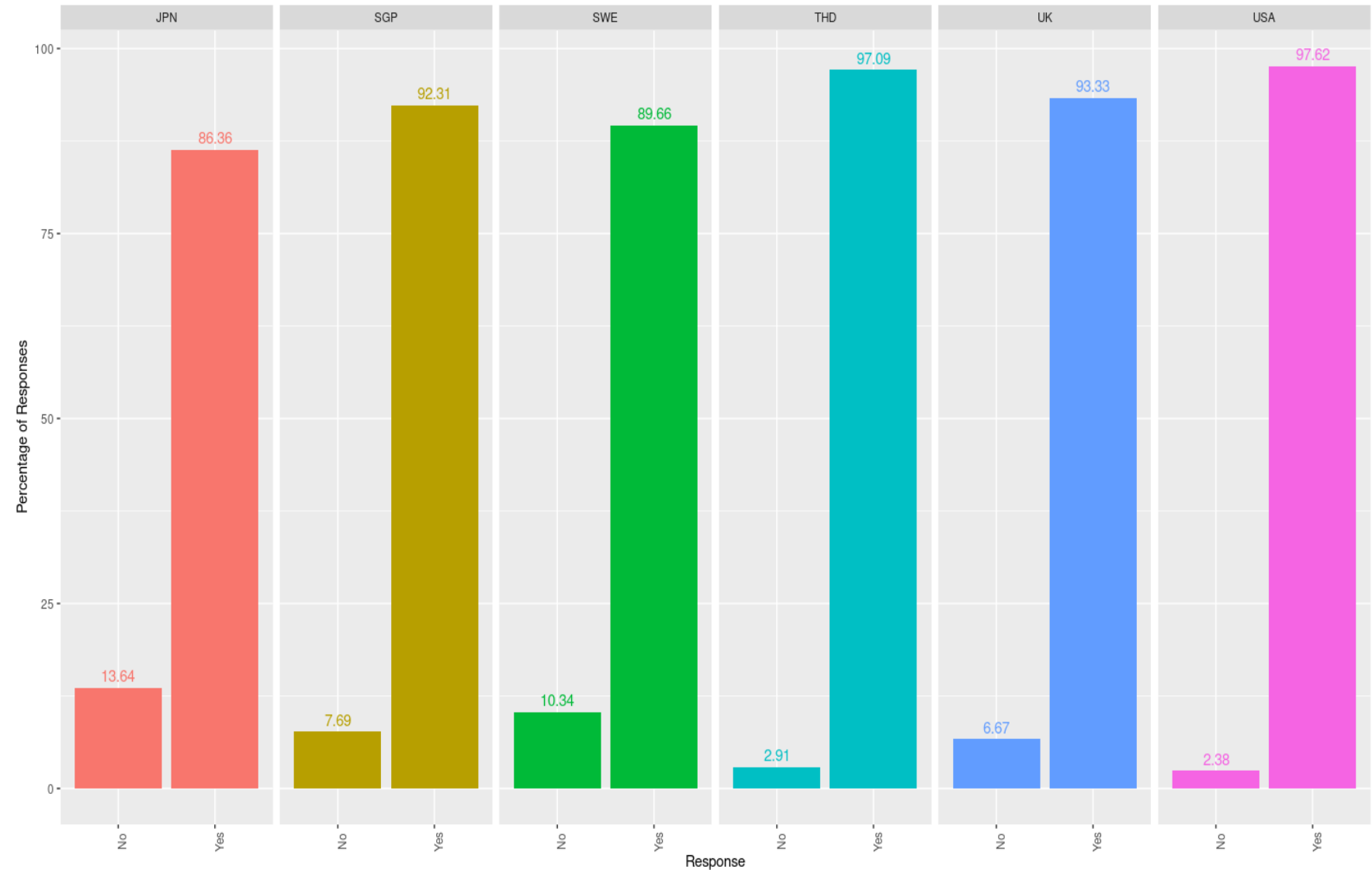
Country	Sample Size
Japan	25
Singapore	40
Sweden	33
Thailand	107
UK	16
USA	48



# Appendix – Additional SurveyMonkey Graphs

If you Could Use Stablecoins as a Payment Method, Do you Believe that your Transactions Would be Secure and Safe?

Percentage of Respondents - See Sample Size Table for Actual Counts

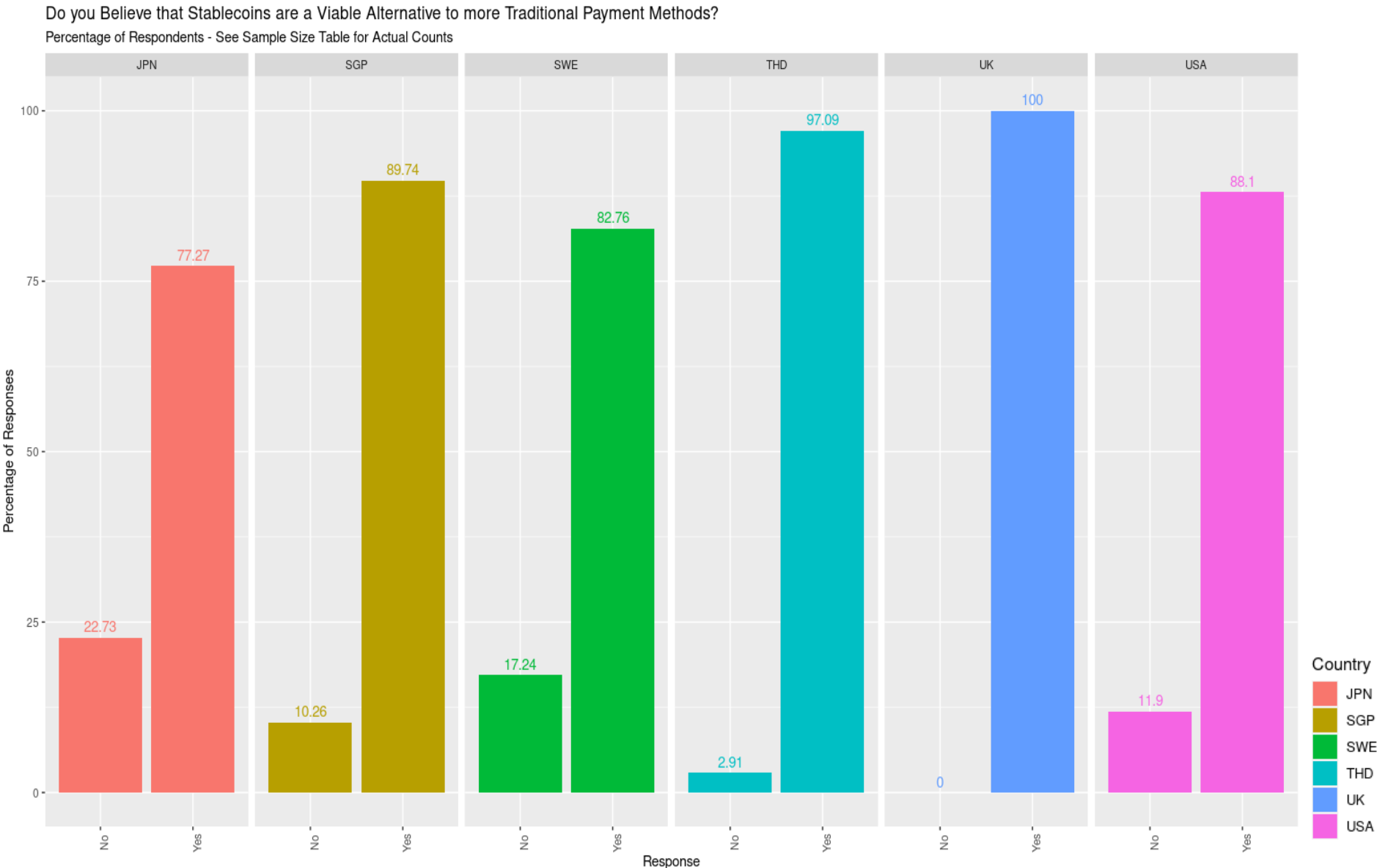


(Source: Survey Monkey)

Country	Sample Size
Japan	22
Singapore	39
Sweden	29
Thailand	103
UK	15
USA	42



# Appendix – Additional SurveyMonkey Graphs

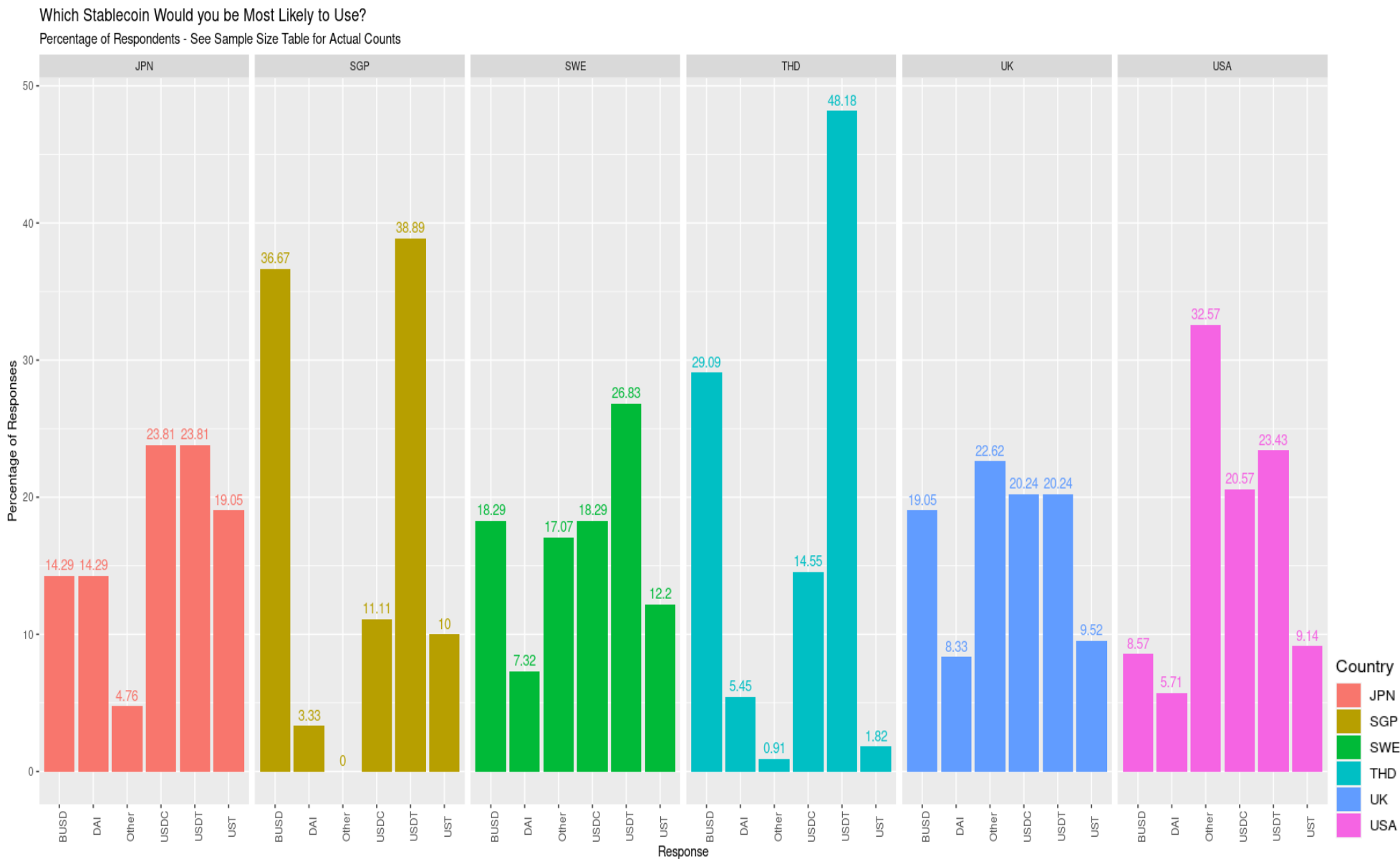


(Source: Survey Monkey)

Country	Sample Size
Japan	22
Singapore	39
Sweden	29
Thailand	103
UK	15
USA	42



# Appendix – Additional SurveyMonkey Graphs



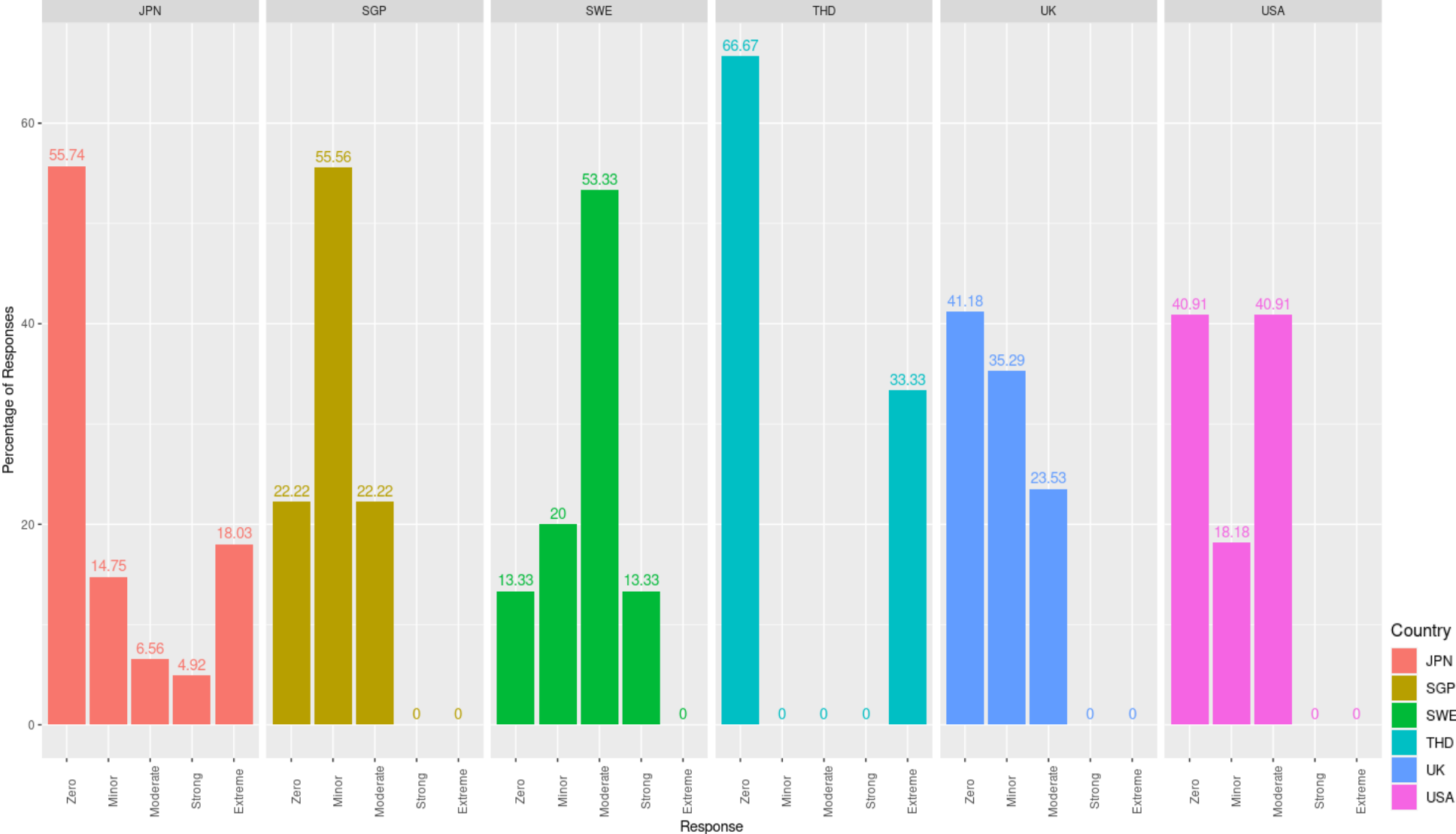
Country	Sample Size
Japan	42
Singapore	90
Sweden	82
Thailand	110
UK	84
USA	175

(Source: Survey Monkey)



# Appendix – Additional SurveyMonkey Graphs

What is your Level of Interest in Learning more About Cryptocurrencies, Including Stablecoins?  
Percentage of Respondents - See Sample Size Table for Actual Counts



(Source: Survey Monkey)

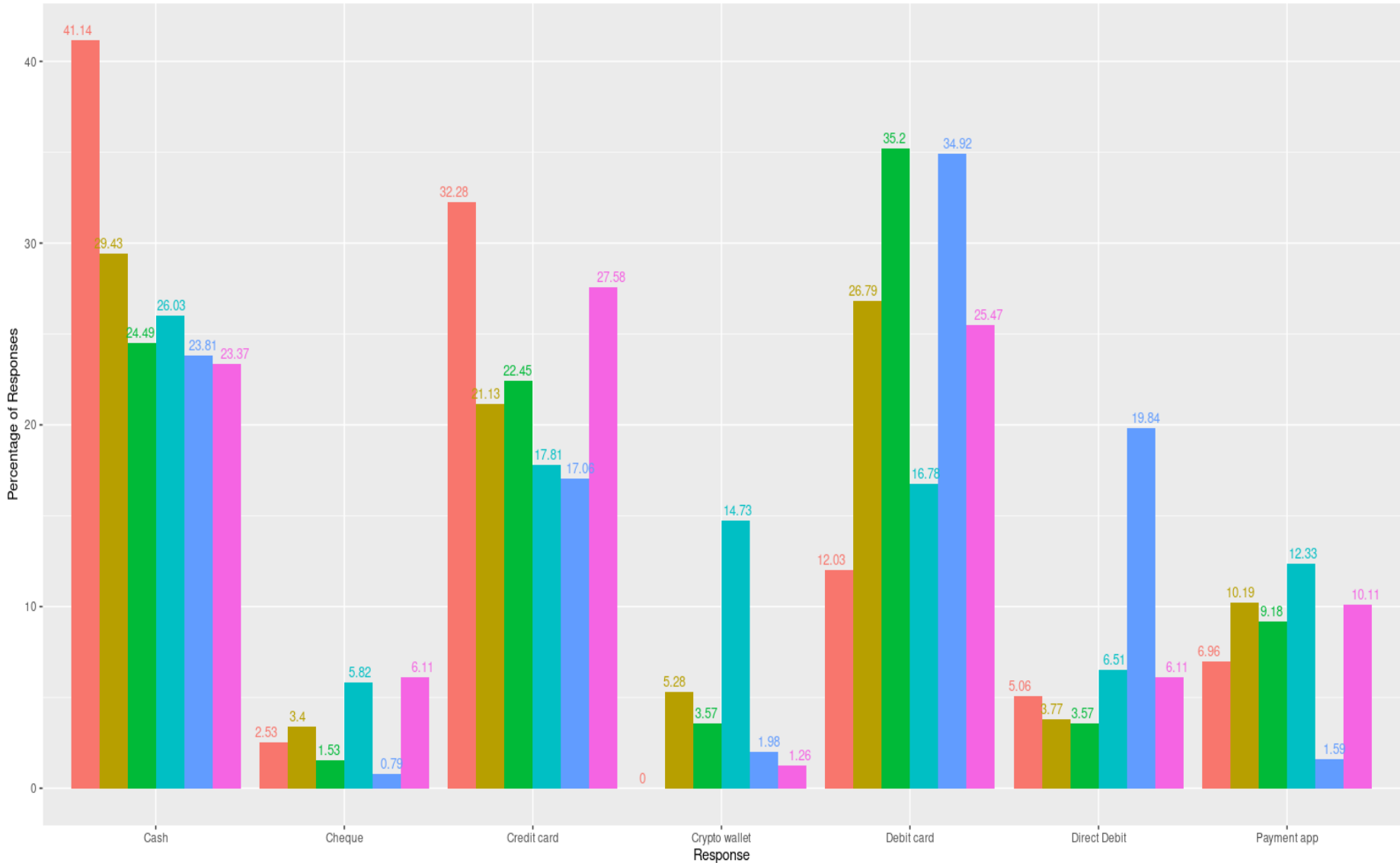
Country	Sample Size
Japan	61
Singapore	9
Sweden	15
Thailand	6
UK	17
USA	22



# Appendix – Additional SurveyMonkey Graphs

Do you Use ANY of the Following Payment Methods on a Daily Basis?

Percentage of Respondents - See Sample Size Table for Actual Counts



Country	Sample Size (Respondents)	Number of responses (Multiple answers)
Japan	100	158
Singapore	100	265
Sweden	100	196
Thailand	117	292
UK	100	252
USA	200	475

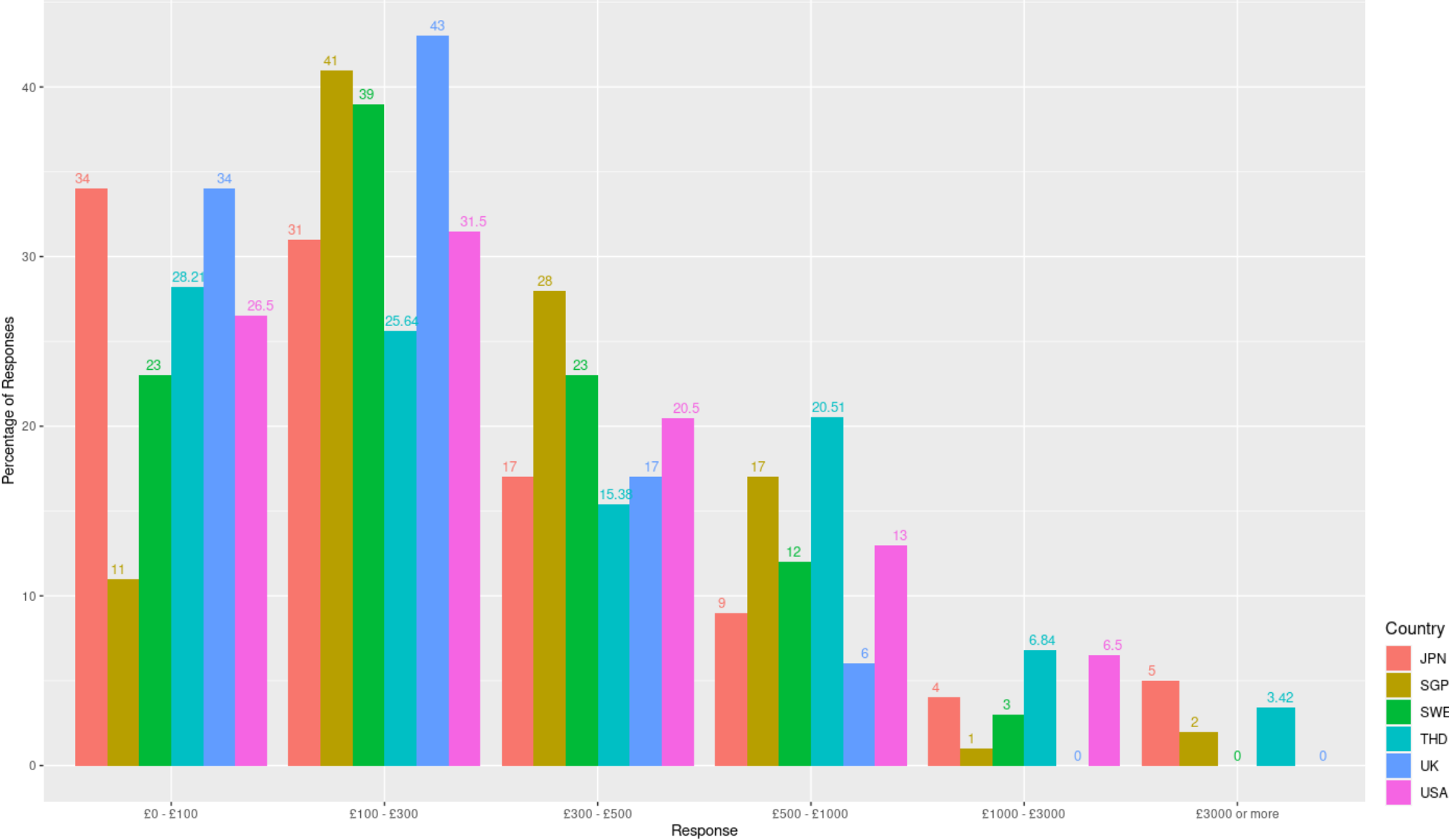
- Country
- JPN
  - SGP
  - SWE
  - THD
  - UK
  - USA

(Source: Survey Monkey)



# Appendix – Additional SurveyMonkey Graphs

Approximately How Much, on Average, Do you Spend using ALL Payment Methods, on a WEEKLY Basis, Excluding Large Items?  
Percentage of Respondents - See Sample Size Table for Actual Counts



(Source: Survey Monkey)

Country	Sample Size
Japan	100
Singapore	100
Sweden	100
Thailand	117
UK	100
USA	200



# Appendix

## User experience comparison (Nuvei, 2022):

