What Does the Future Hold for Crypto Exchanges?

A Joint Report by Boston Consulting Group, Bitget and Foresight Ventures

July 2022

Foreword

Tony Cheng

General Partner, Foresight Ventures & Head of Corporate Development, Bitget

"The crypto market has seen significant progress over the past few years. We have seen the market mature significantly as global user penetration grows with new use cases being built out for Web3 and institutional flows increasing allocation to this new asset class. We believe that as this market develops, even though there will be significant value distributed across all parts of the value chain, the gateway through which users access crypto (including exchanges and wallets) will see the largest value accrual. Being able to act as a one-stop shop is still needed in many developing countries as these users still are transitioning towards Web3. At Bitget and Foresight Ventures, we are betting on a future where Web3 is distributed globally and access is made easy through mobile native experiences. Our goal is to create a vibrant ecosystem that transcends Web2 and Web3, that connects CeFi and DeFi, resulting in an expansive bridge to the vast web of crypto. With this report from BCG, we hope that the deep insights from this report can help users better understand the global exchange landscape as well as the global growth opportunity for the gateways of crypto."

Tjun Tang

Managing Director & Senior Partner, Boston Consulting Group

"Despite the recent market disruption, we believe the market has opportunities for growth ahead. Crypto exchanges play a key role in the Web3 ecosystem by providing access, liquidity, and infrastructure. With competition intensifying, crypto exchanges must adapt to the dynamic market situation and transform their strategy to beat the competition. In this report, we offer perspectives on the future of Web3 adoption, emerging high potential markets, and the crypto exchange competitive landscape and future end-state. We highlight unique growth opportunities that crypto exchanges can explore: strengthening and scaling core offerings; expanding into adjacent products and offerings; developing innovative business models; and leading the way in bringing Web3 solutions to traditional industries."

Contents

What Does the Future Hold for Crypto Exchanges?

1. Executive Summary

Crypto has come a long way in a short time. Over just a few years, the number of use cases has soared, and a deeper, more mature ecosystem has emerged. Through this process, the technology has grown from little more than a concept to becoming a key infrastructure, supporting applications across finance, commerce, gaming and social media. Despite recent disruptions in the crypto market and regulatory headwind, we believe it is still early innings for blockchain technology and crypto. This joint report by BCG, Bitget and Foresight Ventures provides a relatively comprehensive view of the crypto market landscape, with a focus on the future of crypto exchanges given their integral position as the first gateway for Web3 users.

We start by highlighting the maturing of the crypto economy, with an increase in institutional inflows, the rise of Web3 applications that bring potential disruptions to all industries, and the rapid growth of crypto adoption in emerging markets. These factors have contributed to the formation of a $54 trillion global crypto trading market in 2021[1] with significant future headroom to grow. Spot trading will be driven by two interrelated opportunities: 1) Increasing use of crypto as an asset class and a potential hedge against inflation, and 2) Crypto becoming a productive asset, serving as key infrastructure supporting a variety of Web3 applications. And as more institutional investors enter the crypto market, derivatives trading is expected to outgrow spot trading (i.e., crypto derivative-to-spot ratio to increase from its current level and become closer to traditional finance benchmarks).

Based on our analysis, we have identified significant crypto trading growth potential in emerging markets and advanced APAC economies by benchmarking against traditional

1 Crypto trading for spot and derivatives on centralized crypto exchanges.

equity trading. We see LatAm and APAC as the two most attractive regions, and it is likely that we will see further expansion of global exchanges, given the high market potential along with relatively progressive local crypto regulations.

We then shed light on the crypto exchange trading landscape, which has seen trading volumes dominated by centralized exchanges, historically due to ease of use, better liquidity/trading execution and better regulatory compliance as compared with decentralized exchanges. Going forward, we expect to see trading volume growth in both centralized and decentralized exchanges, as they serve different customer needs. Centralized exchanges provide ease of entry and better trading executions for top, large-cap coins, while decentralized exchanges democratize access to decentralized finance (DeFi) innovations by offering investors access to long-tail tokens and having better composability with decentralized applications.

Based on our customer interviews, we categorize target customers of centralized exchanges into four groups: retail traders, high-net-worth traders, proprietary trading firms, and corporations where institutional investors contributed 60–70% of the overall trading volume. We identified five key purchasing criteria: 1) Trading platform robustness including liquidity, security and reliability, 2) Cost structure, 3) Platform vibrancy that includes number of assets covered, breadth of product types and trading tools, 4) Regulatory compliance, and 5) Brand awareness.

We have seen leading exchanges consolidating their leads in both spot and derivative trading markets by leveraging their scale to outperform competitors in customers' key purchasing criteria. The top five crypto exchanges accounted for around 70% of the spot trading volume and around 90% of the derivative trading volume in 2021. However, similarly to how the traditional finance market landscape has evolved historically, regulation will also play an important role in shaping the competitive end-state and preventing winner-takes-all-situations. The recent market downturn has accelerated policymakers' agenda on stricter oversight and tighter regulations. We took an in-depth, scenario-based approach to analyzing the likely outcomes of crypto derivative market regulations and how regulations would impact the competitive landscape in different regions, as derivatives drive significantly more trading volume and are under tighter regulations compared to spot in most jurisdictions. Based on our analysis, we estimate a competitive end-state in which the top five exchanges take a 65–75% share of spot trading globally. We expect the top five exchanges to take an 80–90% share of derivative trading in emerging markets and a 70–80% share of derivative trading in developed economies due to tighter regulatory environments and competition from local regulated players.

Lastly, we outline various growth strategies that crypto exchanges can explore in this fast-evolving market and share best practices from industry leaders. In the short-to-medium term, crypto exchanges should focus on strengthening product offerings by tailoring to their core customers and expanding to emerging markets. In the medium-to-long term, crypto exchanges should explore a combination of different growth tactics ranging from expanding into adjacent fields such as NFTs and DeFi, leveraging exchange tokens to bootstrap ecosystems and user growth, and expanding into traditional finance, especially in emerging markets where financial infrastructure is relatively immature and crypto has the potential to surpass traditional finance. Crypto exchanges can tap into emerging market opportunities by offering crypto-backed services such as loans, remittance, payment services and tokenized stock trading to local customers.

2. Crypto Adoption and Future Growth Potential

2.1 Crypto Economy Is Here to Stay

Despite the recent crypto market slowdown, we believe that crypto economy is here to stay. The top 20 coins today look very different from just 5 years ago. Among these is *Layer 1 tokens*, which can validate and finalize transactions without the need for another network. Overall, the crypto ecosystem has matured significantly, with around 10,000 applications today, compared to 800 in 2017[2]. (See Exhibit 1.) In addition, institutional money has poured into the asset class, leading to lower volatility and a maturing market profile. According to Coinbase's annual company filing, the institutional trading volume share has increased significantly from 20% in 2018 Q1 to 68% by the end of 2021. As observed by research analysts at Andreessen Horowitz, crypto prices drive interest, which drives ideas and activity, which in turn drive innovation. The 2017 ICO boom led to the emergence of crypto exchanges that are leading the market today. (See Exhibit 2.)

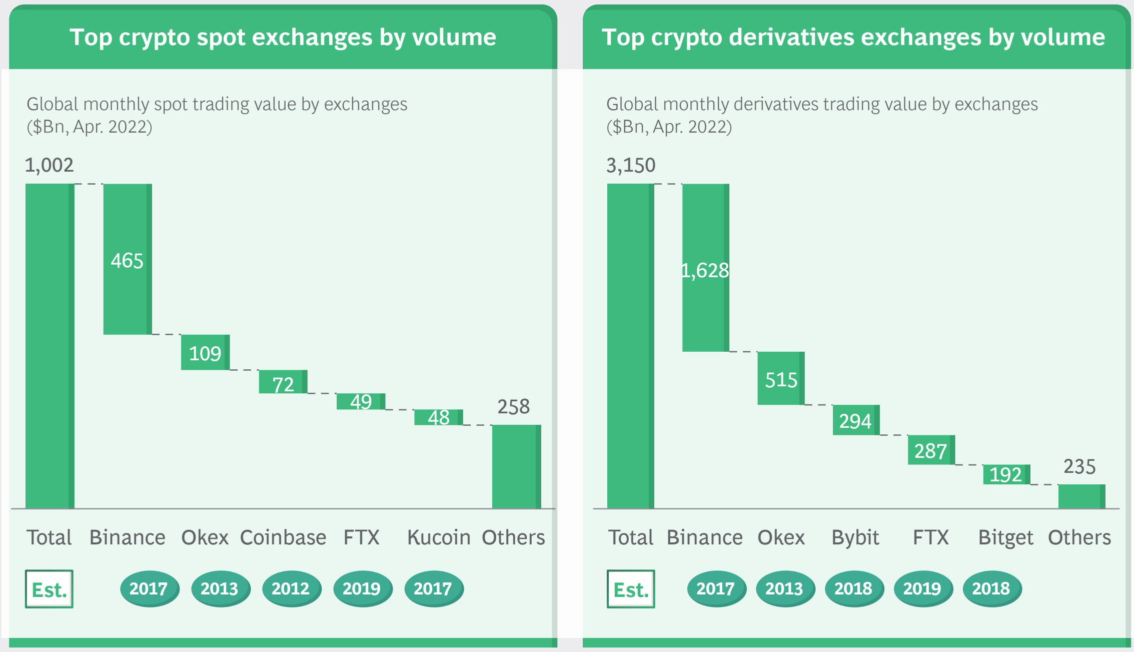
EXHIBIT 1 | Crypto Economy Is Here to Stay with Increased Utility and Maturity

	2017-2018	2020-2021	Key Observations
Description	Crypto mainly as tech concept and store of value with limited support for developers/ecosystem & few use cases	Crypto as key infrastructure empowering a variety of different use cases (e.g., DeFi, GameFi, NFT, etc)	2020-2021 crypto boom driven by increased utility & use cases around smart contracts as L1/L2 blockchains functionalities & development ecosystem support better compared to 2017-2018
Top 20 coins by category[1]	Currency[2] 9, L1 10, Dapps 1; 50% Smart contract development support/applications	Currency[2] 4, L1 9, Dapps 5, Meme 2; 70% Smart contract development supports/applications	
# of application	**~800** (most in early concepts)	**~10,000**	
% Institutional trading volume on Coinbase	**20%** (2018 Q1)	**68%** (2021 Q4)	Increased institutional adoption & decreased volatility of the crypto market show early signs of market maturing
Volatility[3]	**0.053**	**0.039**	

Sources: Coinmarketcap.com; DappRadar; The Block; Yahoo Finance; stateofthedapps.com; BCG analysis.
[1] Top 20 coins by market cap in Dec. 2017 and Jan. 2022.
[2] Serve as digital currency/digital currency payment infrastructure.
[3] Volatility calculated as the average 60-day BTC/USD volatility between Jun.2017.6-Jun. 2018 and Jan. 2021- Dec. 2021.

2 Source: DappRadar, as of January 2022.

EXHIBIT 2 | Leading Exchanges Mostly Originating from Previous Crypto Booms



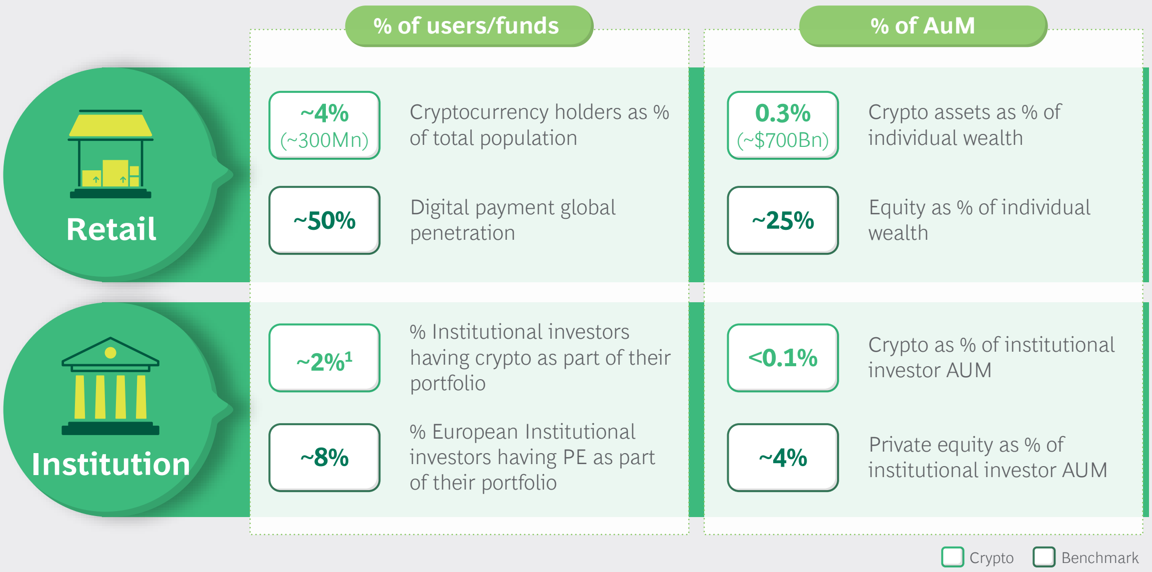
Sources: The Block; Coinglass; BCG analysis.

2.2 Crypto Still at the Beginning of the Adoption Curve

Crypto adoption is rising among both retail and institutions. However, adoption is still low compared to traditional investment assets such as equities, payment technologies and private equity allocation by institutions. BCG estimates that just 0.3% of individual wealth is currently held in crypto assets, in contrast to the 25% that is held in equities. (See Exhibit 3.) Relatively shallow penetration indicates that there is headroom for growth.

For retail cryptocurrency holders, there are significant discrepancies across geographies. North America is the most invested geography, with an average holding of around $18,000 among crypto holders, accounting for 0.4% of total individual wealth. Africa is the least invested, with an estimated average crypto holding of around $190. If we use the number of cryptocurrency holders as a proxy for Web3 users, and benchmark it against the adoption rate of Internet users in the 1990s, the message is clear: there is plenty of growth to come. (See Exhibit 4.) While it is difficult to predict, if the trendline of crypto adoption continues, the total number of crypto users is likely to reach 1 billion by 2030.

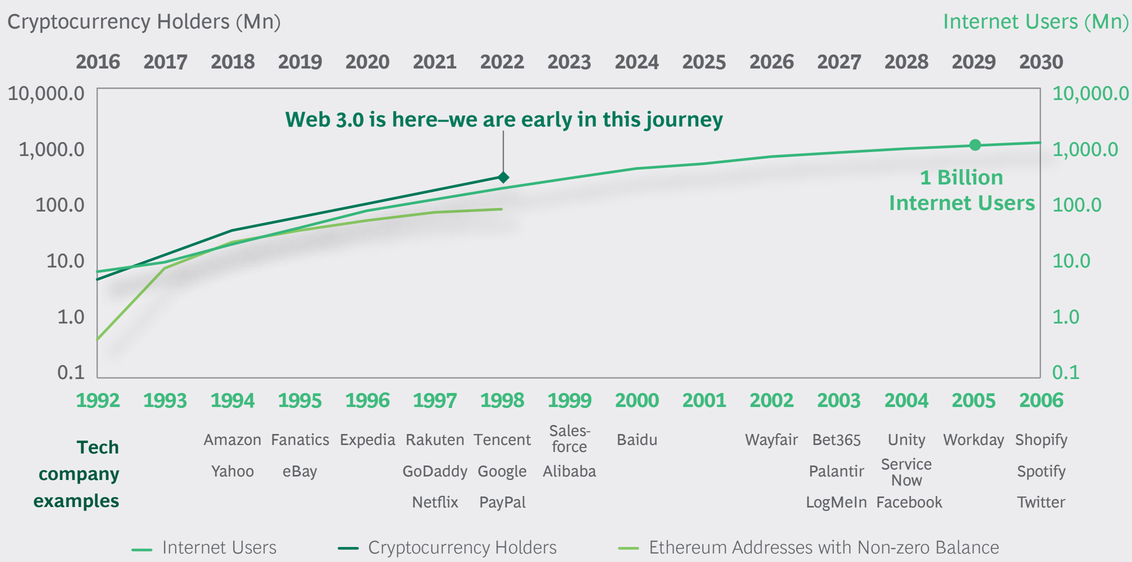
EXHIBIT 3 | Adoption Is Gaining Traction Across Retail & Institutional Investors



Sources: Crypto.com; Bridgewater; Fidelity; BCG Global Wealth Market Sizing 2021; OECD; PwC Report; Mercer; Statista; Iconic fund research; BCG analysis.

[1] Current adoption of cryptocurrency across Asia, US and EU for pension funds, traditional hedge funds and endowments & foundations.

EXHIBIT 4 | Retail Adoption Still at the Beginning of the Curve



Sources: Crypto.com; Cambridge Centre for Alternative Finance; Coin Metrics; World Bank; Company websites; BCG analysis.

Note: The chart is in log scale.

While individual investors are the biggest holders of crypto, institutional interest is growing, albeit unevenly. (See Exhibit 5.) Among institutional investors, hedge funds and venture capital firms are most willing to invest. According to Crypto fund research,[3] these players had almost doubled their exposure to $70 billion (the actual crypto holding will be several times higher following token appreciation since the investment) from the fourth quarter of 2020 to the end of 2021. We expect allocations to continue to rise. There is also an expanding class of crypto-native funds (e.g., Paradigm, Hashed) that are picking up momentum. Traditional private equity funds are also getting bullish on crypto. For example, Bain Capital announced its decision to open a crypto fund in March 2022.

EXHIBIT 5 | Institutional Adoption Is on the Rise and Becoming More Diverse

Risk tolerance / willingness to adopt crypto

High → Low

	Individual Investor	Hedge fund/ Venture capital	Corporations/ banks	Government funds	Pension funds
2021 Crypto AUM	~$713 billion	~$69 billion+ (nominal)[1] (Multiple time considering capital gain)	~$2.5 billion[2]	~$4 billion (US)[3]	~$1 billion
2021 Total AUM	~$263 trillion	$~4.3 trillion	$~20trillion[4]	~$5 trillion (US)	~$61 trillion
Crypto % share	~0.3%	~1-2%	~0.01%	<0.01%	<0.01%
Future outlook	↑↑	↑↑	↑	↑	↑

Sources: Crypto fund research; Fortune; US Treasury; BCG analysis.
[1] Crypto AuM includes crypto hedge funds, crypto venture funds, private equity and others.
[2] Holding of BTC of Fortune 500 companies at the end of 2021.
[3] Holding of BTC by US government as of Feb. 2022.
[4] Total asset of non-financial Fortune 500 companies.

Corporations including Tesla, Square, and business intelligence company MicroStrategy have bought cryptocurrency as either an asset or a hedge. Meanwhile, payment companies including PayPal, Mastercard and (again) Square are starting to offer users the opportunity to transact with crypto. If the market continues to stabilize, more corporate investment is likely, alongside rising investment in other Web3 technologies.

3 Source: https://cryptofundresearch.com/q4-2021-crypto-fund-report/.

Top banks are investing in crypto- and blockchain-based projects, as well as providing crypto custodian services. Morgan Stanley began offering its wealth management clients access to Bitcoin funds in March 2021, and BNY has invested in the Fireblocks platform, which allows financial institutions to issue, move and store cryptocurrencies. J.P. Morgan was the first bank to launch an in-house BTC fund and has focused on developing digital blockchain assets.

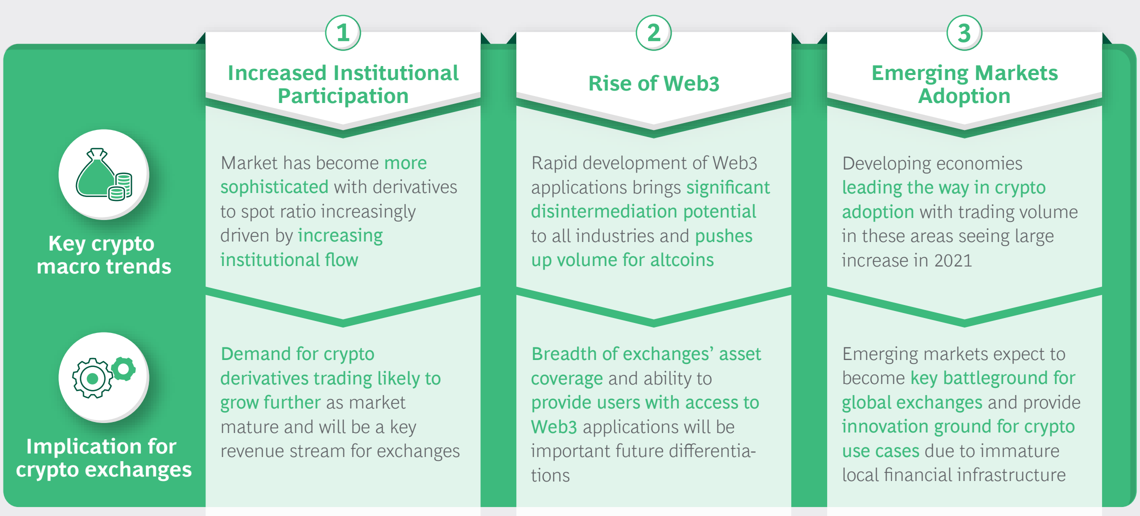
Pension funds are among the most risk-averse investors, but even these are starting to obtain exposure to crypto, often through ETFs, or indirectly through investment in block-chain companies. One prominent example is the Ontario Teachers' Pension Plan investing in crypto exchange FTX.

One reason for rising institutional interest is that crypto currencies such as Bitcoin can be a useful hedge against inflation and offer a low correlation with other asset classes. In addition, performance over recent years has exceeded that of other major assets classes. The S&P 500 in 2021 returned 29%, compared to Bitcoin's 62%. The emergence of a range of trading and management tools is also supporting institutional adoption.

2.3 Three Macro Trends Impacting the Growth of Crypto Exchanges

As crypto adoption continues to increase, three macro trends that impact the growth of crypto exchanges start to emerge. (See Exhibit 6.)

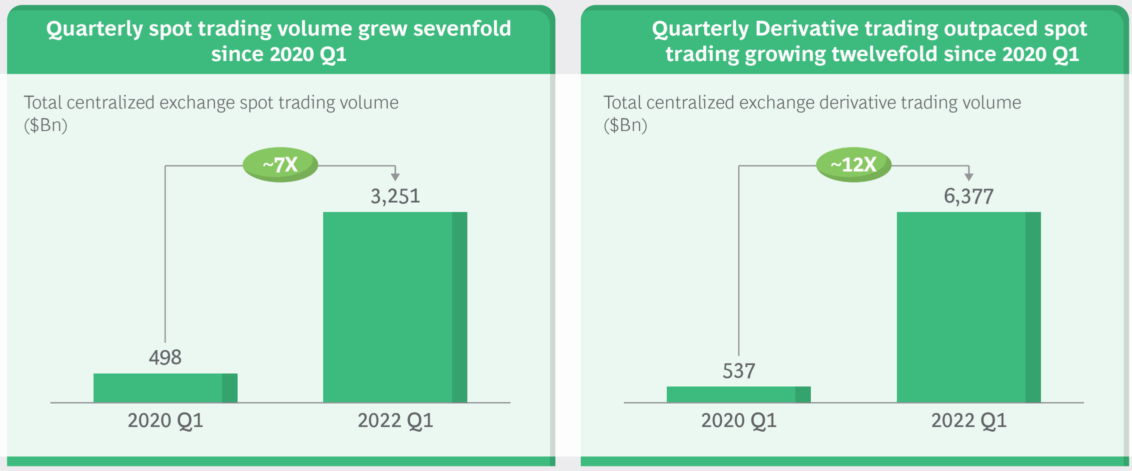
EXHIBIT 6 | Crypto Macro Trends Impacting Crypto Exchanges



Trend 1: Crypto Trading Market Becomes More Sophisticated with Increased Institutional Participation

Global trading volumes have increased significantly over the past two years. (See Exhibit 7.) Global quarterly spot trading volume grew sevenfold to $3.2 trillion in the two years to the first quarter of 2022. Crypto derivatives trading expanded twelvefold to $6.3 trillion. Crypto derivative trading has historically been dominated by perpetual swaps for Bitcoin and Ether. These still account for over two thirds of open interest among the top 100 derivatives.[4]

EXHIBIT 7 | Crypto Trading Volume Increased Sharply Driven by Increased Crypto Adoption from Both Retail and Institutional Investors



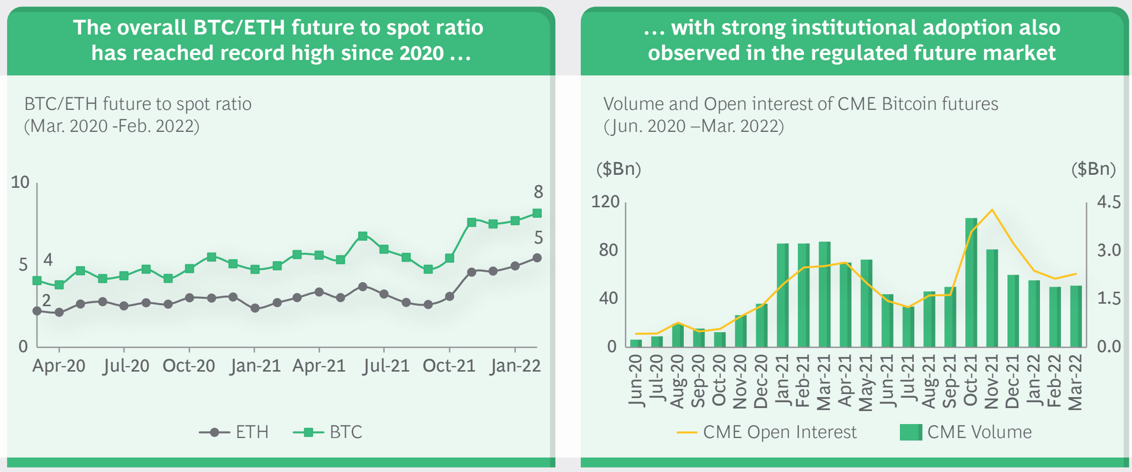
Sources: The Block; Coinglass; BCG analysis.

Perpetual swaps are crypto-native innovations first introduced by the crypto exchange BitMEX. They are closely related to traditional cash-settled futures, but with no expiration date. This means there is no need to periodically roll over or cash-settle contracts. In addition, perpetuals can be traded on margin with considerable leverage (some exchanges offer beyond 100x leverage). Perpetuals maintain their price to the underlying's spot price through what is known as a funding rate. There are other types of crypto futures that are more similar to cash-settle, quarterly futures. Given the similarity between dated futures and perpetual swaps, we use the term future to cover both perpetual swaps and futures with a fixed maturity date.

4 Source: Coinglass, Top 100 Derivatives by Open Interest as of May 2022.

The ratio of derivatives to spot volumes helps us understand how these markets compare. Derivatives volume is measured in notional terms, which can be misleading,[5] but there is still value in the comparison in understanding the direction of crypto trading. The Bitcoin future-to-spot ratio rose from 4 at the start of 2020 to 8 in February 2022. The Ethereum future-to-spot ratio more than doubled from 2 to 5. (See Exhibit 8.) A related factor is the inflow of institutional capital into the futures space, which can be indicated by an increase in both open interest and trading volume for Chicago Mercantile Exchange (CME) crypto futures.

EXHIBIT 8 | BTC/ETC Future to Spot Ratio Increases as Customer Mix Shift Towards Institutional Investors



Sources: The Block; Coinglass; BCG analysis.

The institutional investors trading crypto derivatives today are mostly prop trading firms. They may prefer to participate in crypto markets via derivatives for several reasons.

- **More trading strategies.** Derivatives allow prop trading firms to engage in more trading strategies. For example, crypto options allow traders to create a straddle to speculate on volatility. Crypto futures allow traders to create a basis trading strategy by buying crypto and selling a future against it to capture the interest from the difference between spot and future.

- **Higher capital efficiency.** Margin allows prop traders to hold positions with margin (only a portion of the position value), which means they can more efficiently allocate capital.

5 See "CoinDesk: Crypto Derivatives: On misleading measurements".

- **Better risk management.** A prop trader may use a Bitcoin future to hedge away risk of the BTC/USD price movement between now and future expiry.

- **Simplicity.** Cash-settled derivatives allow investors to gain direct exposure to crypto without owning crypto assets and worrying about custody.

- **Tax efficiency.** In some jurisdictions, derivatives trading carries tax benefits. For example, in the US, 60% of gains on derivatives contracts are taxed as long-term capital gains regardless of the duration of the contract.

Benchmarking against exchange-traded equity, gold and foreign exchange, we see significant room for growth in crypto derivatives trading. The crypto derivative-to-spot trading ratio is lower than US equity, global exchange-traded gold and global foreign exchange, primarily due to the relative immaturity of the crypto market and lower institutional participation. (See Exhibit 9.)

EXHIBIT 9 | The Crypto Derivative Market Has Growth Potential

Comparison with other exchange traded spot and derivative products

	Crypto 2021	US Equity[1] 2021	Global Gold 2021[2]	Global FX 2019
Spot Market cap / Deriv. Open Interest	\$2.25 Tn[3] / ~\$30 Bn[3]	\$52.2 Tn / -	~\$590 Bn / ~\$107 Bn	~\$100 Tn[4] / ~\$448Bn
Annual Spot trading value (OTC)	~\$20.6 Tn	~\$124 Tn	~\$0.9[5] (19) Tn	(~\$725) Tn
Annual Derivative trading value[6] (OTC)	~\$32.9 Tn	~\$509 Tn	~\$13.7 Tn	\$56 (~\$1600) Tn
Annual Future trading value[6]	~\$32.5 Tn	~\$166 Tn	~\$11.4 Tn	~\$52 Tn
Annual Options trading value[6]	~\$0.4 Tn	~\$343 Tn	~\$2.5 Tn	~\$4 Tn
Spot trading velocity[7] (OTC)	~9.2	~2.4	~1.6 (~32)	(~7)
Derivative trading velocity[7]	~1083	-	~128	~125
Derivative: Spot trading value ratio	~1.6	~4	~15	~2.3[8]

Sources: Coinmarktecap.com; The Block; WEF; The World Gold Council; Companies market cap; BIS; BCG analysis.

Note: (OTC) indicates trading value facilitated with OTC venues; Trading value US exchanges which do not report trading value to WFE is estimated based on top contracts traded.

[1] Exchange traded equity, equity derivatives include exchange traded, standardized derivative products including single stock derivative, single stock future, stock index future, stock index derivative, and stock ETF derivative.

[2] London Gold Market trading value excluded as it's an OTC market.

[3] Crypto market cap and open interest as end of 2021.

[4] Global M2 supply as of March 2022.

[5] Estimated based on daily trading value of Shanghai Gold Exchange, the largest physical exchange for gold and gold-backed ETF spot trading.

[6] Notional value.

[7] Trading velocity calculated as trading value divided by market cap for spot and open interest for derivatives.

[8] OTC derivative and spot trading value.

However, crypto spot and derivative turnover velocity are much higher than that of traditional finance. This is due to higher arbitrage volume caused by price discrepancies between exchanges and regions, the operations of decentralized applications, the fact that crypto exchanges operate around the clock, and the availability of leverage.

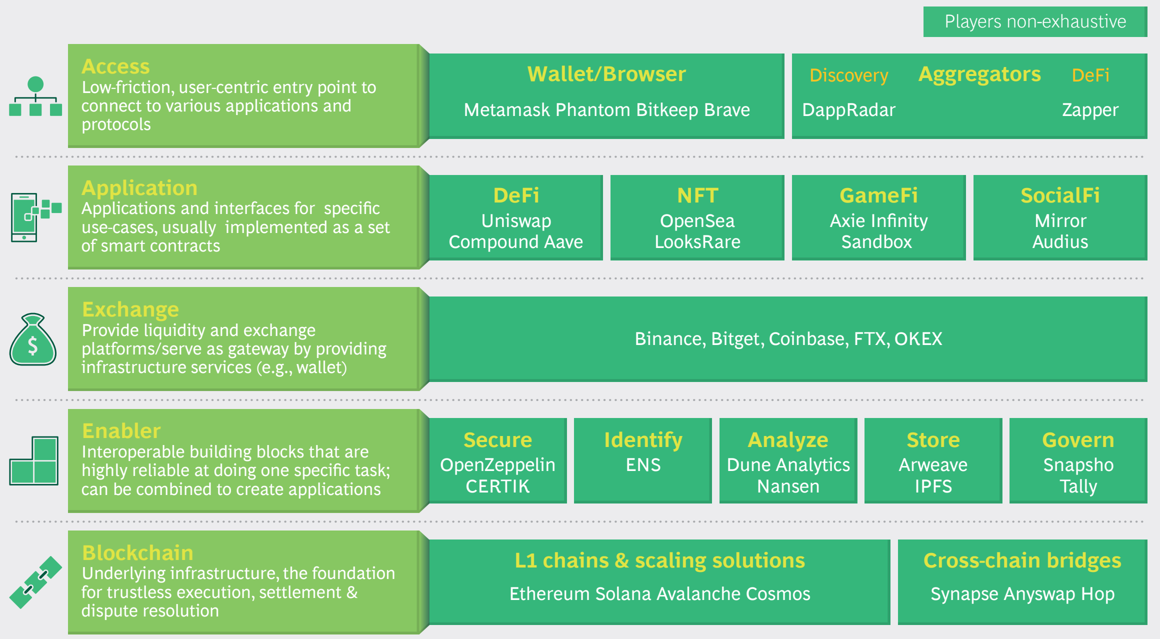
The rise of smart contract-based altcoins means crypto assets are gradually taking on the attributes of productive assets. Ethereum is developing into a cross-over asset, amid a unique blend of equity, commodity and monetary characteristics. In just a few years, it has generated $10 billion in transaction fees. That same feat took Amazon twice as long to accomplish. In the third quarter of 2021, Eth tokens took on productive asset features: through a governance process, Ethereum, activated a "token burn" revenue share mechanism to distribute transaction fees to miners and Eth tokens holders. The native tokens of leading decentralized applications are also taking productive asset features. Sushiswap, a leading decentralized exchange (DEX), distributed a platform fee among liquidity providers and governance token holders. Compared with other productive assets, we see a significant growth opportunity for crypto market capitalization of about $1.2 trillion.[6] According to the World Federation of Exchanges, Global equity market capitalization was around $106 trillion in 2020, while the global bond market was worth about $124 trillion in 2020 based on a SIFMA estimate. Global real estate value was estimated to be $326 trillion in 2020 by Savills Research.

Trend 2: Rapid Development of Web3 Applications Brings Significant Disintermediation Potential and Has Led to an Increase in the Trading Volume of Altcoins

In the initial iteration of the internet (Web1), users consumed digital content created by publishers or third parties. Web2 allowed users to both create and consume content, but centralized networks continued to control (and make money from) distribution. In the emerging Web3 iteration, users consume, create and own content. In this phase, networks (and money exchanged) are decentralized, with blockchain technology replacing centralized intermediaries and providing the trust that enables both consumption and exchange. There are numerous players emerging across different stacks of the crypto ecosystem looking to disrupt value pools currently held by Web2 applications. (See Exhibit 10.) For example, Audius is a decentralized protocol for music streaming that allows creators to earn tokens by uploading music and curating playlists while eliminating the platform fee charged by traditional music platforms such as Spotify. Because of the value that creators bring to the network, Audius gives them network ownership. Brave leveraged its Basic Attention Token (BAT), which monetizes user attention to drive user growth and create value for advertisers, publishers and users in the ecosystem.

6 Market cap as of May 17, 2022, according to Coin Market Cap.

EXHIBIT 10 | Exchanges Uniquely Positioned to Provide Liquidity and Access to Web 3.0 Services



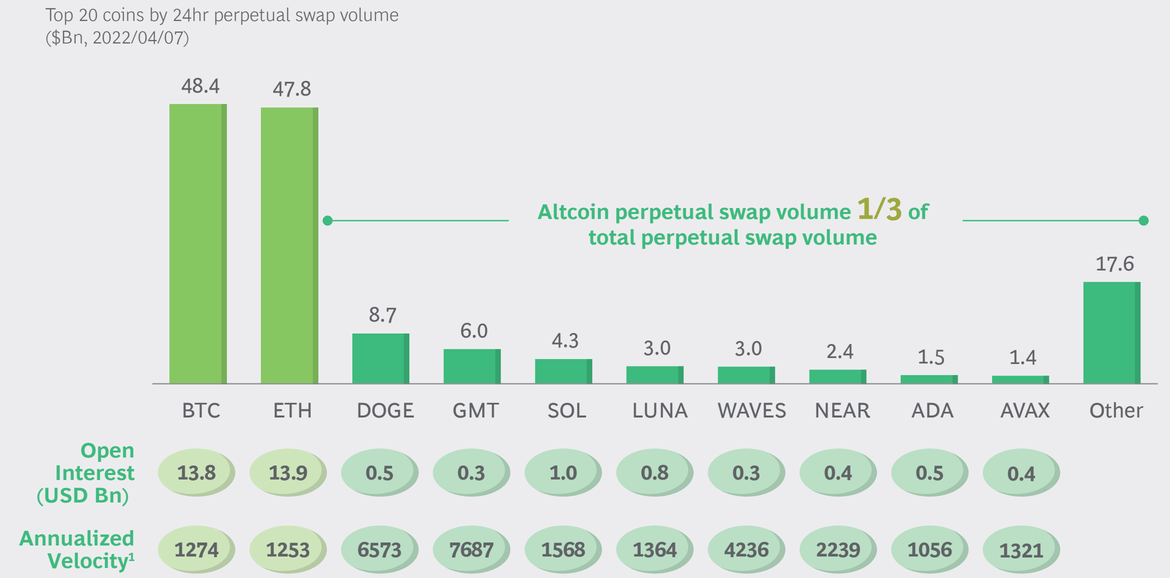
Among these, crypto exchanges are uniquely positioned to provide entry into the Web3 ecosystem, as well as to boost liquidity. Centralized exchanges can also take on the responsibility of providing infrastructure for crypto custody via exchange custodial wallets. As a result of the rapid rise of Web3 applications, smart contract-based tokens are gaining traction due to their ability to significantly disrupt Web2 value pools. For example, over 70% of the spot trading volume increase between 2020 and 2021 was driven by altcoins, and altcoins accounted for over a third of perpetual swap volume in 2022. (See Exhibit 11.)

Trend 3: Emerging Markets Are Leading the Way in Crypto Adoption with a Significant Increase in Crypto Trading Volume in 2021

While the average individual crypto holding among crypto currency holders is lower in emerging countries, crypto penetration is already higher than in developed countries. (See Exhibit 12.) According to recent Statista survey data,[7] crypto penetration in Nigeria is over 40% higher than traditional banking penetration in the country. For emerging markets with less mature financial infrastructure, crypto brings unique opportunities to provide traditional finance services.

7 https://www.statista.com/statistics/1202468/global-cryptocurrency-ownership/.

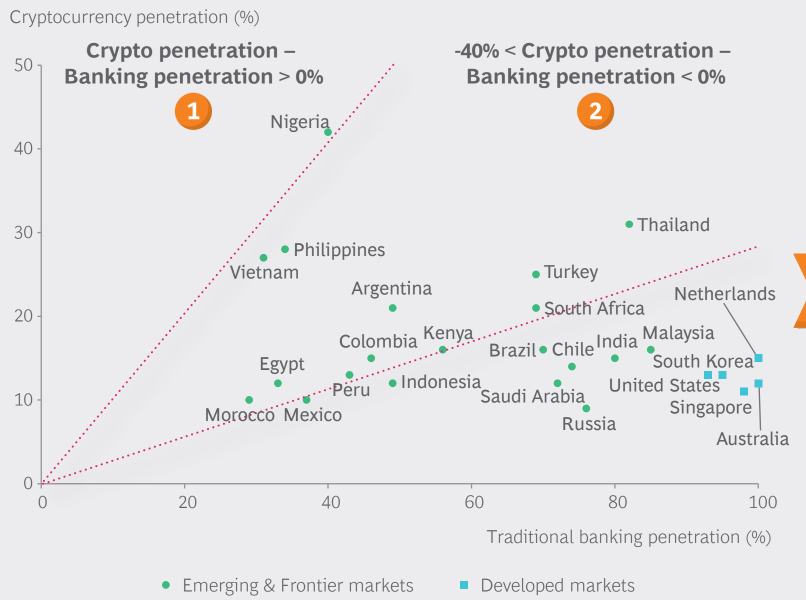
EXHIBIT 11 | Altcoins Account for Substantial Share of Perpetual Swap Volume



Sources: Coinglass; BCG analysis.

[1] Daily perpetual swap volume / open interest * 365.

EXHIBIT 12 | Emerging Markets Have Higher Crypto Penetration and Expect to Become Fertile Ground for Crypto Innovations



For emerging markets with less matured traditional financial infrastructure (1 2), crypto have the opportunities to see more day-to-day use case (i.e., cross-border remittance, wealth mgmt. , payment network) compared to advanced economies with crypto adoption primarily driven by crypto as an alternative investment assets / technology innovations

Crypto exchanges have the unique opportunity to tap into these use cases to enhance customer value propositions and acquire more customers to the platform

Sources: Statista; Global Finance; MSCI; BCG analysis.

In our analysis, we have identified four emerging market crypto use cases, and provided examples of how crypto exchanges are tapping into these opportunities:

- **Crypto-backed wealth management.** In countries such as Argentina and Turkey, which have seen significant currency devaluation, crypto currencies, and especially stablecoins, are an alternative store of value, and a way to gain exposure to US dollars. In emerging countries, crypto exchanges are also taking steps to create Defilading's products, providing crypto-backed wealth management for unbanked individuals. In Argentina, local crypto exchange Buenbit offers interest on DAI, BTC and ETH by acting as a bridge to audited DeFi protocols such as Aave, Compound and Curve, where customers can earn up to 10% annualized interest.

- **Crypto cross-border remittance.** Cross-border remittance flow is significant in emerging markets, but the current remittance process is long and expensive (on average 5–7% for emerging markets, and over 10% in some countries in LatAm, according to World Bank estimates). Mexican crypto exchange Bitso partnered with global fintech firm Circle to facilitate $1.2 billion of yearly remittance flows between the US and Mexico at reduced fees compared to traditional remittance services.

- **X-to-earn.** The future of work coordinated by decentralized autonomous organizations (DAOs) will unlock new earning opportunities. These will be particularly attractive to emerging markets that struggled economically during the Covid pandemic. One prominent example of x-to-earn is play-to-earn and GameFi applications. Southeast Asia and LatAm have the largest user bases for popular play-to-earn game Axie Infinity, in which gamers can earn a living wage for playing games and earn in-game items. Another earning model is contribute-to-earn. RaidGuild is a DAO consisting of a diverse pool of software development talent focusing on Web3 development, where DAO members can earn income by providing functional expertise. In the future, DAO might offer a viable career path for some emerging market consumers, creating the chance to earn more money than is offered locally.

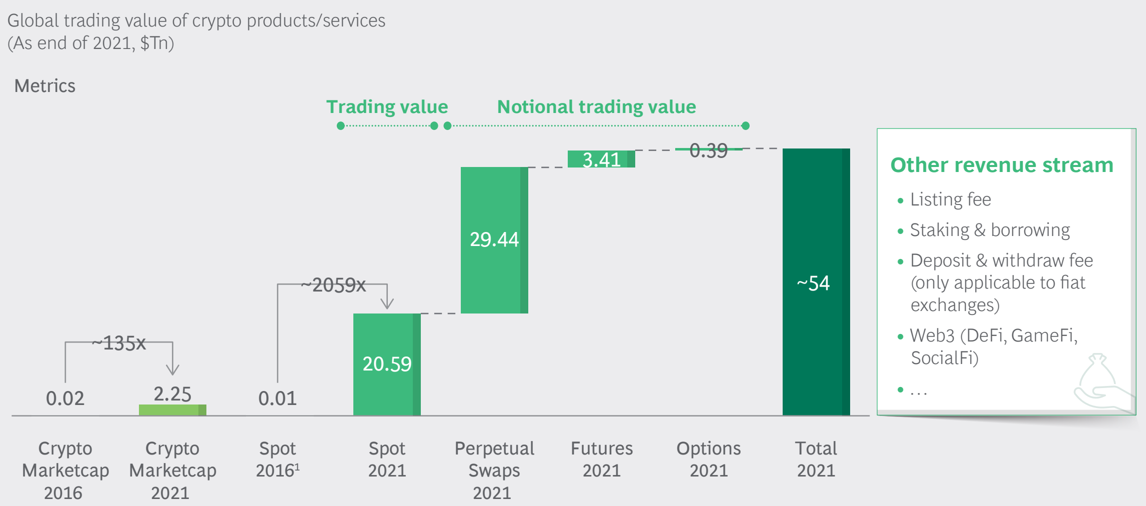
- **Crypto-backed payment.** In emerging market ecommerce in countries such as Brazil and Mexico, crypto-backed payments are increasingly popular as a cheaper alternative to traditional payment infrastructures. Leading Mexican retailer Elektra recently announced it would accept Bitcoin payments through integration with Bitpay, a US-based crypto exchange/payment company. The payment option shows the FX rate and allows users to transfer funds via a QR code or crypto key.

As a result of the rapid innovation and crypto adoption in emerging markets, we also see increased trading volume share. Spot trading volume in emerging markets (MEA, LatAm and APAC) rose from 26% in January 2021 to 32% in December 2021. Derivatives volume share in the same region grew from 39% to 42% during the same period.

2.4 Centralized Crypto Trading: A Large Market Opportunity

The increase in crypto adoption and macro trends contribute to the growth of the global crypto trading volume. The global centralized crypto trading volume was $54 trillion in 2021. Spot trading volume was $20.6 trillion, more than 2000 times 2016 volumes. Historically, spot trading volume strongly correlates with overall crypto market capitalization and volatility. In derivatives, annual trading volume is about $33.2 trillion, mostly in perpetual swaps offered on crypto-native trading platforms. (See Exhibit 13.)

EXHIBIT 13 | Global Centralized Exchange Volume Reached ~$54Tn in 2021



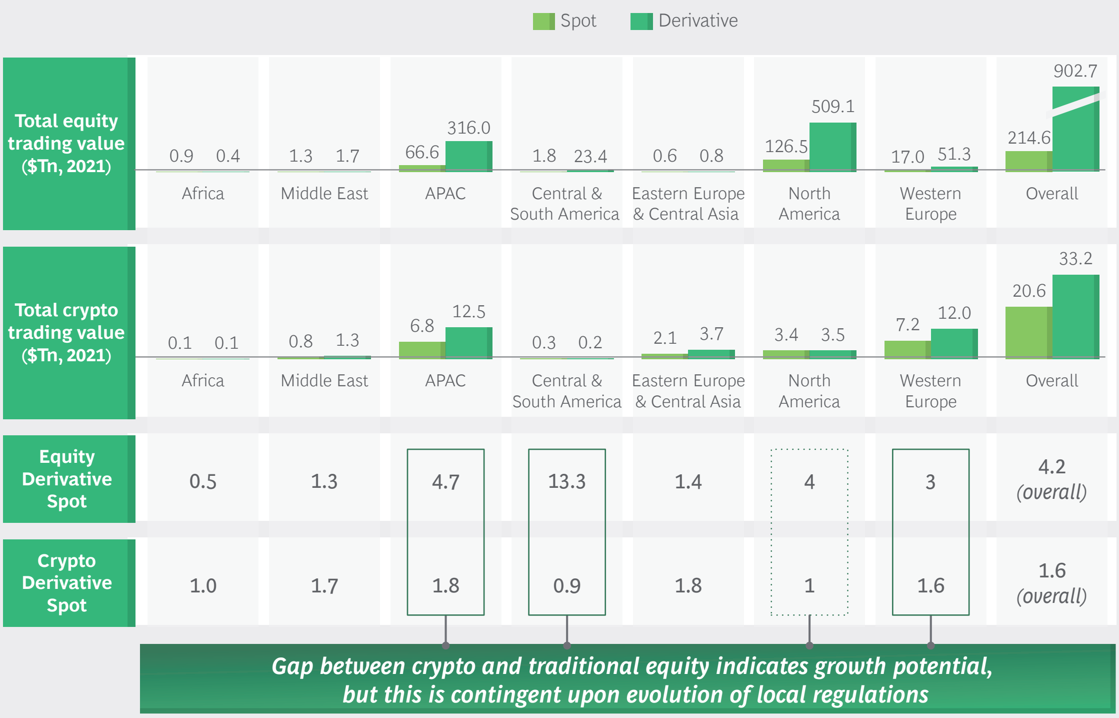
Sources: Coinmarketcap.com; The Block; Token Insight; Messari; BCG analysis.
Note: Perpetual swaps, future, options volume split based on Token Insight report.
[1] Use Bitcoin spot volume as proxy.

Trading is a major source of revenue for crypto exchanges, which also generate revenue from token listing, staking and borrowing, fiat deposits and withdrawals, and Web3-related activities.

Spot trading volume is primarily influenced by total crypto market cap and market volatility. Growth in market capitalization could be driven by two interrelated opportunities. First, crypto could grow as an asset class and a potential hedge against inflation, leading to price increases. According to Goldman Sachs, cryptocurrencies currently account for roughly 20% of the global "store of value" market. According to some projections, Bitcoin may one day account for more than 50% of the global "store of value" market, resulting in a Bitcoin value of more than $100,000. The second primary use case is crypto as infrastructure for a variety of Web3 applications. We expect the growth of these assets to be stronger than that of Bitcoin because they are productive, with the ability to generate revenue/dividends beyond price appreciation. Another factor that influences spot trading volume is market volatility. As more institutional investors come into the crypto market, we expect volatility to fall.

Crypto derivatives have more growth headroom than spot trading. We expect higher crypto derivative growth in emerging markets in LatAm and APAC, as well as in advanced economies, reflecting more advanced financial markets with mature regulatory environments regarding derivatives. (See Exhibit 14.) The overall crypto derivative-to-spot ratio is expected to get closer to those observed in traditional equity markets.

EXHIBIT 14 | Future Growth Potential in Crypto Trading Indicated by Current Low Derivative to Spot Ratio Compared to Traditional Finance



Sources: The Block; SimilarWeb; WFE; BCG analysis.
Note: Equity trading value for US based exchanges which do not report trading value to WFE is estimated based on top contracts traded.

We expect more product innovation within crypto derivatives, favoring futures and options rather than perpetual swaps. For example, cash-settled non-deliverable forwards (NDFs) may gain more traction from injections of institutional capital. NDFs may also provide use cases that are unique to crypto. For example, an investor with a portfolio of NFTs built on Ethereum blockchain may use NDFs to hedge the risk related to ether.

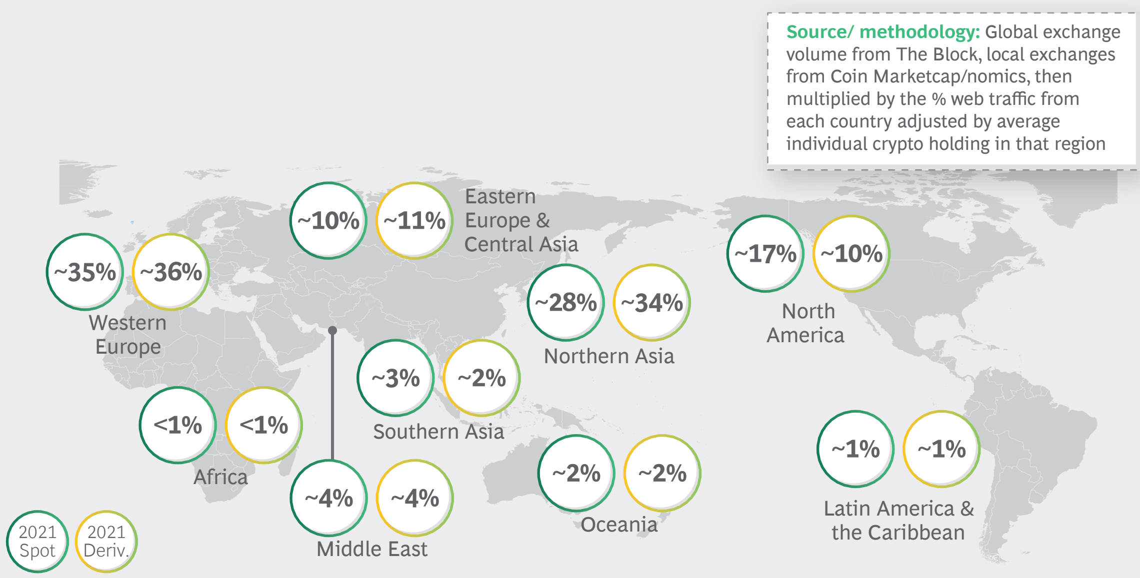
The emergence of institutional investors has boosted demand for hedging and more sophisticated ways of generating yield. Options are more complex than futures and are still relatively niche. Currently only a few assets, including Bitcoin and Ether, are offered as underlyings. Over the next 12 months, we will see more organized players entering the centralized options market to support demand from a range of players. FTX's acquisition of LedgerX in October last year marked the start of this trend. In addition, new option-based products are emerging. Options vaults, for example, enable players to stake assets that are then deployed to options strategies such as covered calls and cash-covered puts. The yield of the vaults is further enhanced by token rewards and investment in yield-bearing tokens. Once deemed accessible (by regulation), institutional investors may increasingly tap into these products, for example by selling short-dated options to collect volatility premiums.

3. Crypto Trading Hot Spots

3.1 Global Crypto Growth Region Trading Overview

As discussed in the previous section, emerging markets and advanced APAC economies are particularly attractive for global exchange players due to strong crypto trading growth fueled by crypto adoption, high future crypto trading potential compared to traditional finance, and opportunities for crypto exchanges to expand services beyond trading to provide day-to-day use cases to local customers. Emerging markets and advanced APAC countries accounted for one third of global spot trading volumes and around 40% of global derivative trading volumes in 2021. (See Exhibit 15.)

EXHIBIT 15 | Global Crypto Trading Landscape



Sources: The Block; Coinmarketcap; Nomics; SimilarWeb; BCG analysis.
Note: Emerging market includes LATAM, Africa, Middle East and Southern Asia; Advanced APAC economies include Northern Asia and Oceania.

In spot markets, there are three archetypes, primarily driven by local regulations.

- **Local exchange dominates.** In countries such as Thailand and the Philippines, it is typically difficult for offshore exchanges to obtain licenses to operate onshore. Regulated fiat exchanges account for a large share of the market. Global players are attempting to capture markets through alliances, acquisitions and joint ventures. For example, Binance attempted to re-enter Malaysia through a strategic investment in

MX global, one of the four regulated digital asset exchanges in the market, after suspending its services in 2021 due to the actions of local regulators.

- **Global exchange dominates.** In countries with friendly exchange regulations or unclear regulations—such as Mexico, South Africa and Brazil—global exchanges are able to leverage scale and technology advantages to capture a larger share of the spot market. Global players typically adopt greenfield or acquisition strategies.

- **Global offshore exchange exclusive.** In countries where crypto currency is banned or illegal, such as Egypt and Pakistan, only global offshore exchanges and peer-to-peer exchanges operate.

Across these markets, global offshore exchanges dominate the derivatives trading market, because local players either do not have the capabilities to offer, or are not permitted to offer, derivative products, as derivatives are considered financial instruments in most onshore jurisdictions and are therefore subject to strict regulations.

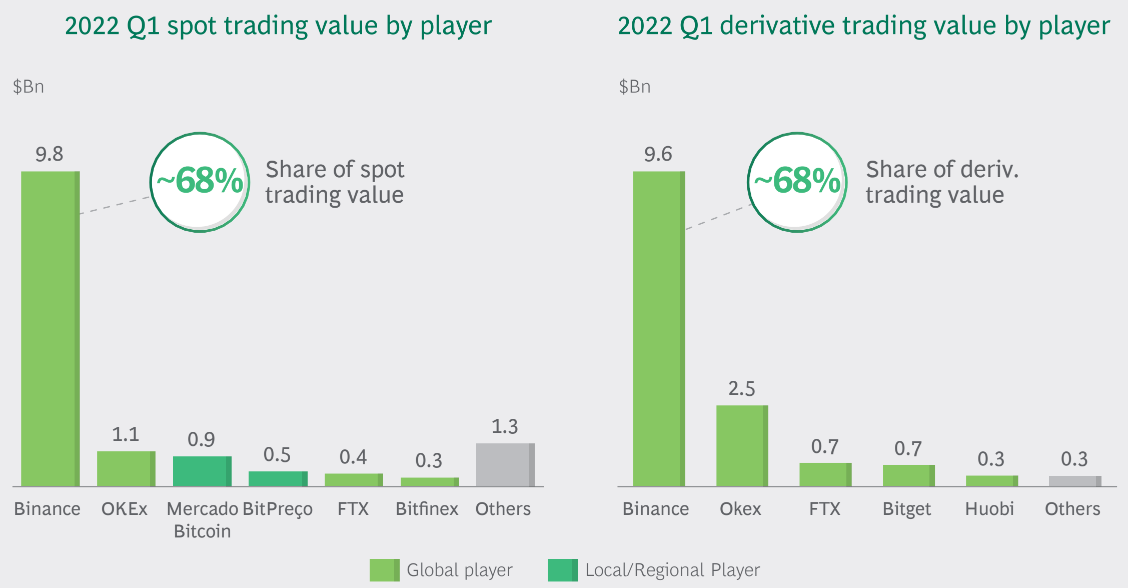
In the rest of this section, we will deep-dive into Latin America, Africa, the Middle East and APAC. We will evaluate market attractiveness through the lens of 1) Crypto trading market size, 2) Competitive landscape, 3) Market potential with a focus on derivatives, and 4) Regulatory environment, to identify the most attractive regions and countries into which global exchanges will most likely enter, or in which they will further expand their existing footprints.

3.2 Latin America

Market size. LatAm crypto centralized exchange trading accounts for about 1% of global spot and derivative trading value. Brazil is the largest crypto market, with more sophisticated crypto users and a higher percentage of institutional investors; Argentina, Venezuela and Mexico also have significant trading volumes, driven by retail.

Competition. Binance is the dominant global player in the region. Local players such as Bitso and Mercado Bitcoin have garnered significant investment, but currently focus exclusively on spot products. They have taken a significant share of their respective home regions. In Brazil, we see both a local fiat exchange and global offshore exchange in the spot market. (See Exhibit 16.) However, the local crypto derivative market is dominated by offshore players, reflecting technology capabilities. In due course, and as regulation allows, we expect global offshore players to move onshore. Binance has stopped offering crypto derivatives on the Brazilian version of its website due to regulatory pressure and is now in

EXHIBIT 16 | Binance Dominates Both Spot and Derivative Trading Where Local Players Present Only in Spot in Brazil



Sources: The Block; SimilarWeb; Chainalysis; Expert Interview; BCG analysis.

the process of acquiring a local financial broker to offer derivatives. The local traditional exchange B3 is also seeking to enter the crypto derivative market.

Market potential. Brazil has the highest crypto derivative potential in the region, given its equity-derivative-to-spot ratio of about 15 in traditional finance, and its current low crypto-derivative-to-spot ratio (<1).

Regulation. Overall, LatAm has a friendly regulatory environment for crypto exchanges and spot trading. However, Brazil has stricter regulations on derivative trading. Binance was given a regulatory warning for offering derivative products.

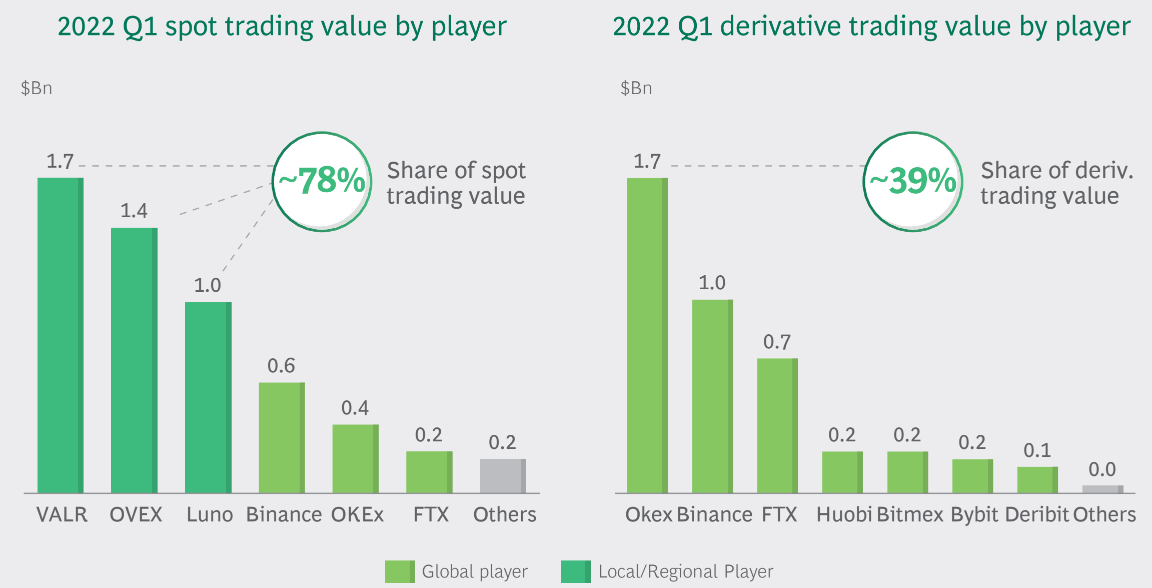
We also saw that Argentina recently took a hardline approach to crypto regulations, banning financial institutions from transacting or facilitating transactions with their clients in digital asset trading.

3.3 Africa

Market size. Africa's crypto centralized exchange trading accounts for less than 1% of global spot and derivative trading. However, the region has seen an increase in this area in the past year. South Africa is the largest market, reflecting its more advanced financial infrastructure and fiat-to-crypto payment rail. Nigeria is the second largest market. South Africans primarily use crypto as an alternative investment, while Nigerians use it mainly for savings.

Competition. In South Africa, local spot exchanges such as VALR and Luno are gaining market share by targeting retail users. These offer seamless fiat on-off ramps and an easy-to-navigate user experience. According to Chi Nnadi, CEO of the newly founded African local exchange MARA, "Many global exchanges cannot operate in the region due to regulatory challenges and difficulties in reaching the African consumer in an authentic way."[8] The derivative market is still dominated by global players. (See Exhibit 17.)

EXHIBIT 17 | Regional Players Take Majority Share in Spot, Global Players Dominates Derivatives in South Africa



Sources: The Block; SimilarWeb; Chainalysis; Expert Interview; BCG analysis.

Market potential. We expect strong growth in crypto adoption in Africa. However, derivatives may lag given their limited use in traditional markets.

Regulation. South Africa has a progressive regulatory framework and is friendly toward global exchange players. Conversely, countries such as Algeria and Egypt have banned crypto, while others are developing regulatory frameworks.

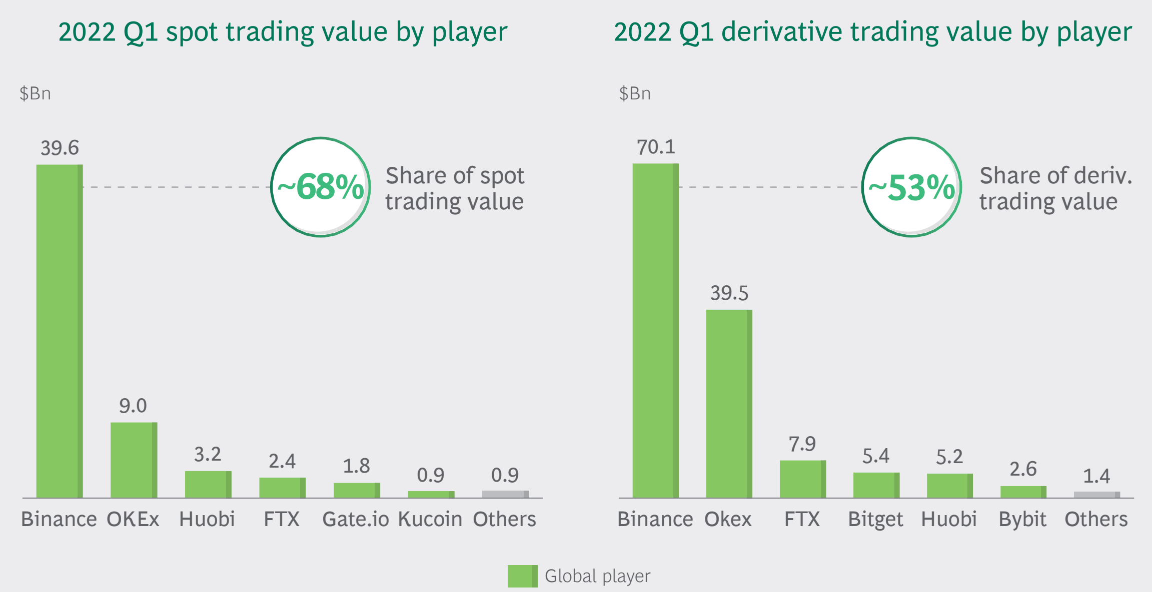
8 Source : Cointelegraph — Backed by Coinbase and Alameda, African exchange MARA eyes continental prospects.

3.4 Middle East

Market size. Middle Eastern crypto centralized exchange trading accounted for about 4% of global total spot and derivative trading value in 2021. Turkey, Saudi Arabia and the UAE are responsible for most trading in both spot and derivatives. Turkey accounts for around two thirds of the crypto trading value in the region.

Competition. Binance dominates the Turkish market with a 68% share in spot and about 50% share in derivatives. (See Exhibit 18.) It also has a leading position in the UAE (off-shore). Local players such as BitOasis, Coinmena and Rain have limited crypto asset coverage and exclusively focus on spot products. FTX obtained the first digital asset exchange license in the UAE, with a plan to offer regulated derivative products.

EXHIBIT 18 | Binance Dominates the Crypto Trading Market in Turkey



Sources: The Block; SimilarWeb; Chainalysis; Expert Interview; BCG analysis.

Market potential. Israel has the most potential, due to its relatively mature financial market. Its historic equity-derivative-to-spot ratio of about 11 is significantly higher than its crypto-derivative-to-spot ratio. We also see the UAE becoming a regional crypto trading and innovation hub due to its receptiveness of crypto.

Regulation. The Middle East has relatively strict crypto regulations, with a high number of bans. The UAE is an outlier, accepting crypto payments and offering virtual asset licenses.

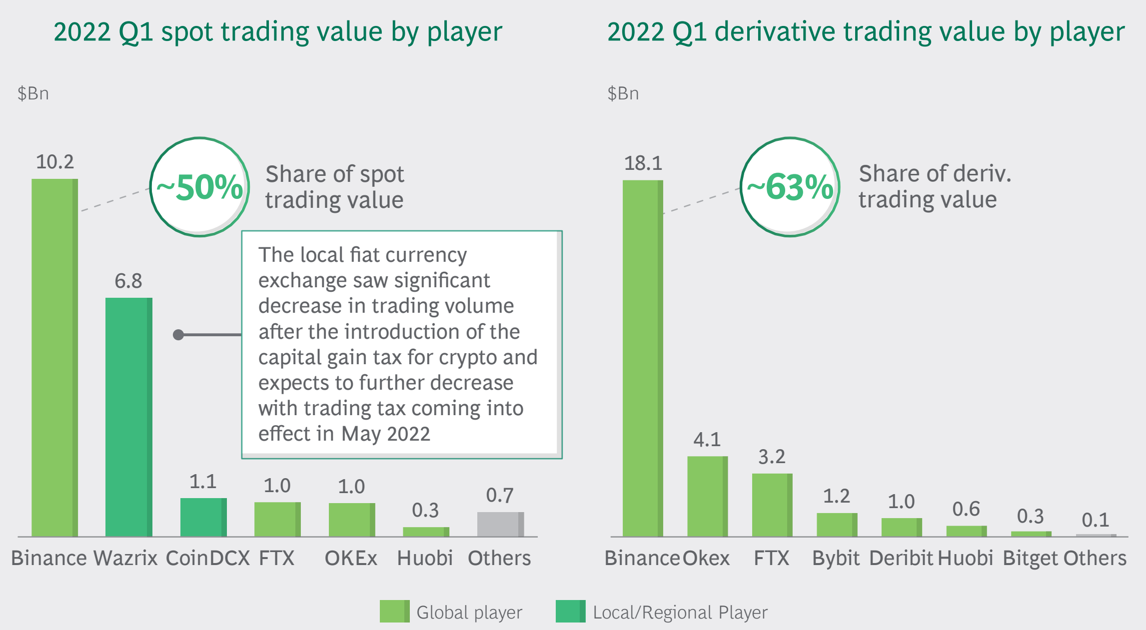
Israel is also developing a crypto regulatory framework that takes a passporting approach (i.e., accepting an entity that has a current license from regulators that are recognized locally).

3.5 APAC — Southern Asia

Market size. Southern Asia accounts for about 2–3% of the global crypto trading value. India, Thailand and Vietnam are the largest markets in terms of trading value. Crypto trading in Southern Asia is retail-driven, and among young traders there is a greater tendency toward speculative and social trading.

Competition. Local fiat exchanges (Wazrix & CoinDCX in India, Vindax in Vietnam) have a stronger presence in the local spot markets. Most local exchanges in top markets (except for CoinDCX) shy away from derivatives. This is due to regulations and the fact that derivatives markets are dominated by offshore exchanges. (See Exhibit 19.)

EXHIBIT 19 | Global and Regional Players Compete in Spot While Derivatives Dominated by Global players in India



Sources: The Block; SimilarWeb; Chainalysis; Expert Interview; BCG analysis.

Market potential. India has the highest future growth potential, as reflected by its equity-derivative-to-spot ratio in traditional finance of about 80, and a significant number of retail equity derivative traders, who may enter the market as adoption widens and regulations becomes clearer.

Regulation. Crypto regulation in Southern Asia is maturing, as evidenced by the introduction of tax laws in India and Thailand and the emergence of a regulatory framework in Vietnam. This may lead to a short-term impact on local fiat exchange trading, but in the longer term, this may lay the groundwork for increased retail and institutional adoption.

3.6 APAC — Northern Asia & Oceania

Market size. Northern Asia and Oceania account for about 30% of the global crypto trading value. Korea has the largest derivative trading market in the region (all derivative volume via offshore global exchanges).

Competition. Local exchanges have a large share of the spot market, with strong backing from local investors and corporations. They have been able to leverage partners to build relationships with commercial banks to provide fiat on-off ramps. For example, Korea's onshore local spot market is dominated by a "Big four" local exchange with strong backing from local investors and conglomerates. However, none of the local exchanges is offering derivatives onshore — again due to regulation and the dominance of offshore exchanges.

Market potential. Korea has the highest crypto derivative growth potential, as reflected by strong derivative trading activity in traditional equities (derivative-to-spot ratio of 12 in 2021).

Regulation. Crypto regulation in Northern Asia & Oceania is relatively advanced. Crypto exchanges are required to have licenses to operate in most countries. Korea is taking a more cautious approach, with stricter know-your-customer (KYC) rules. It also limits the ability of Korean traders to move crypto to overseas exchanges through implementation of the travel rule (traders can only send crypto to their own accounts via offshore exchange).

Overall, LatAm and APAC are the two most attractive regions for global players to expand into, due to higher market potential and progressive crypto regulations.

4. Crypto Exchange Competitive Landscape and End-State Perspective

4.1 CEX and DEX: A Future of Co-Existence and Increased Convergence

Crypto exchanges can be primarily divided into two subgroups: centralized (CEX) and decentralized (DEX). Centralized exchanges are usually controlled by a single entity and carry out transactions through a centralized high-performance trade-matching engine. They take custody of users' funds. While many are not fully regulated in all the jurisdictions that they serve, most have implemented KYC and anti-money-laundering (AML) rules. Centralized exchanges still dominate trading volumes in both spot and derivatives (See Exhibit 20.) Decentralized exchanges carry out transactions on-chain, meaning that trade execution and some part of the trading cost is subject to the performance of underlying blockchains. Users are responsible for custody of their own funds.

EXHIBIT 20 | CEX Dominates Trading Volume Despite the Robust Growth from Decentralized Exchanges

	CeFi–Exchanges		DeFi–Exchanges	
Definition	Each CEX running own orderbook processed by a closed internal system		Decentralized market places that facilitate trades among users on-chain	
Instruments	Spot	Derivative	Spot	Derivative
Trading volume ('21)	~$18 Tn	~$28 Tn	~$1.3 Tn	~$0.4 Tn
Platform Revenue pool ('21)	~$15–20 Bn	~$10–15 Bn	~$650 Mn	~$250–300 Mn
Top 5 players concentration by volume ('21)	~21 / ~79	~14 / ~86	~19 / ~81	~5 / ~95
Top players example	• Binance • Coinbase • FTX • Kucoin • Gate.IO	• Binance • FTX • Bitget • Okex • Bybit	• Curve • Uniswap v2/V3 • Pancakeswap • Sushiswap	• Dydx • MCDEX • Perpetual Protocol • Opyn

Top 5 Others

Sources: The Block; Token Terminal; BCG analysis.

The differences between the trading volumes of centralized and decentralized exchanges have historically been driven by the advantages of CEX over DEX, which are as follows:

- **Platform usability and easier fiat/crypto conversion experience** that make CEX an easy point of entry for retail crypto investors.

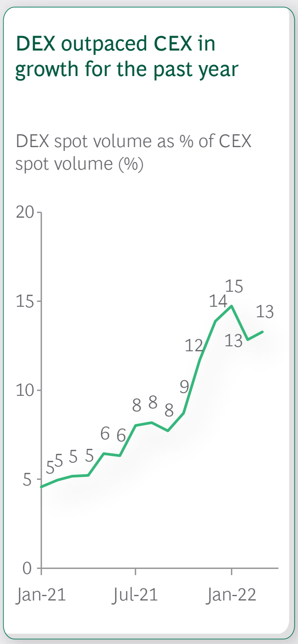
- **Better trading performance in terms of execution speed**, with much **more liquidity** across spot/derivatives for top coins with larger market capitalization.

- **KYC/AML compliance**, which is important for regulated institutional investors, and also lowers adoption barriers for retail investors.

For derivatives, centralized exchanges profit from their scale advantages, including more asset coverage, higher liquidity, lower transaction costs and better risk management, leading to lower margin requirements. The DEX model is still relatively niche in derivatives trading.

We expect that both CEX and DEX will continue to see robust growth in the future. (See Exhibit 21.) We expect CEX to drive significant volume in spot for major coins, and for DEX to see strong volume growth in the spot segment by providing access to DeFi innovations via long-tail tokens and better integration with decentralized applications. A recent Paradigm study shows that liquidity in ETH/USD trading pairs on Uniswap V3 is double that on Binance and Coinbase.[9] CEX is likely to continue to dominate crypto derivative trading

EXHIBIT 21 | Both CEX & DEX Will Continue to See Strong Growth in the Future



		Retail	Institution	Risk/hacks	New projects	Overall
Past	CEX	Function as a point of entry to onboard users due to ease-of-use, fiat/crypto conversion	Strong adoption due to increased regulatory clarity and maturing trading infrastructure	CEX has improved security of the platform as well as limiting scams via stricter listing requirement	CEX enters relatively mature stage of dev. increasingly compete on scale & compliance	
Past	DEX	Retail adoption driven by increased demand for Dapp usage & DEX token incentives	Primarily driven by crypto native firms who often have investments in protocol tokens	Lack of regulations & relatively early dev. stage of DeFi lead to hack/exploits inhibiting trading volume growth	Open source, open innovation culture lead to proliferation of DeFi projects	
Future	CEX	CEX will remain the first point of entry to onboard future crypto users	As institutional investors increase allocation to crypto, demand for more complex crypto financial instruments will also rise	With regulations and increased scale of CEX, security will continue to be strengthened	CEX increasingly tapping into DeFi for product innovations to retain existing users & acquire new users to the platform	
Future	DEX	As blockchain infra. (alt-chain & l2) and usability (aggregator) continue to improve, the retail barrier to entry will be lowered	Permissioned DeFistill relatively early, due to lack of regulatory clarity unlikely to see significant traditional investors trading flow	Hacks/exploits likely remain aspain points for further adoption / trading volume growth	DeFiexpects to remain innovative engine, but at risk of slowing due to players introducing barrier (e.g., Uniswapv3 / Metamasklicenses)	

Sources: The Block; BCG analysis.

9 https://www.paradigm.xyz/2022/05/the-dominance-of-uniswap-v3-liquidity.

given the high technical barrier and liquidity required to provide derivatives products, and increased trading flow from institutional investors due to better regulatory compliance.

We also expect to see a convergence between decentralized finance (DeFi) (DEX) and centralized finance (CeFi) (CEX) exchanges. This will lower barriers to entry in DEX and contribute to DeFi innovation through CeFi ecosystems and funds. Among recent initiatives, Binance launched a Pancake Swap mini program, under which CeFi users can access DeFi protocols in a more user-friendly manner. Bitget launched its Project Acceleration Program, combining its centralized exchange with DeFi wallet Bitkeep to help users bridge CeFi and DeFi and venture arm Foresight Ventures in order to fuel the growth of DeFi projects.

4.2 What Is the Key to Winning over Crypto Traders Today?

According to our interviews with customers of centralized exchanges, institutional players have more complex needs than other investors in the crypto market, and more regulatory considerations than retail traders. Key purchasing criteria for the two groups are:

- **Platform robustness.** Platform robustness refers to qualities including perception of security, ability to prevent hacks or compensate users, and liquidity. Institutional investors have high requirements for trust, as they usually require investment-board approval. They also require more liquidity from trading venues and lower slippage for large trades. Retail investors are more concerned with ease of fiat-crypto conversion.

- **Cost structure.** Efficient platform technology facilitates low transaction costs. Institutional investors typically enjoy volume-based discounts but are willing to pay for additional services (e.g., Coinbase Custody). Retail investors are more price sensitive and can always switch to other platforms.

- **Platform vibrancy.** Platform vibrancy refers to qualities including number of coins covered, product types, trading tools and ease of use. Institutional investors seek stable API access, with the ability to get information and change orders quickly. They look for platforms with more arbitrage opportunities on different trading pairs. Meanwhile, retail investors look for exchanges with a large coverage of coins and a more user-friendly interface. They often prefer mobile apps.

- **Licensing/Regulatory compliance.** Exchanges will require regulatory approval and licensing from local regulators to operate in regulated markets and serve both institutional and retail customers.

- **Brand awareness.** Recognizable brand names and marketing are important to onboard crypto-curious retail investors to the trading platform. Brand awareness is of secondary importance to institutional investors if the table stakes are met.

Retail investors are further segmented into wealth groups. Institutional investors are segmented into high-frequency traders, prop trading firms and corporations, as well as emerging classes such as miners. In derivatives trading, retail investors use retail-focused exchange platforms (e.g., Bitget and OKEx) and contribute 80–90% of the trading volume. High-frequency traders and prop trading firms use institutionally focused platforms (e.g., Binance and FTX) and contribute 70–80% of the trading volume. Each type of investor has its own derivatives trading behavior, patterns and pain points.

- **Retail traders.** Retail traders account for about 10% of overall derivatives trading volume. They primarily trade perpetual swaps, which are relatively simple to understand, and are often driven by community-driven trading features such as copy trading, which further lowers barriers to adoption. For more complicated products like options, time and effort are required to educate these investors.

- **HNW traders.** HNW traders account for about 10–20% of derivatives trading volume. They execute derivatives to hedge their crypto holdings and are more likely to increase their activity in altcoins. The main market groups for HNW traders belong to those who are able to trade in jurisdictions outside the US, such as Hong Kong and Singapore. HNW traders take fewer risks than they did a few years ago, reflecting a shift in market dynamics. Regulations also prevent some HNW traders from trading derivatives in the US, but they can trade elsewhere.

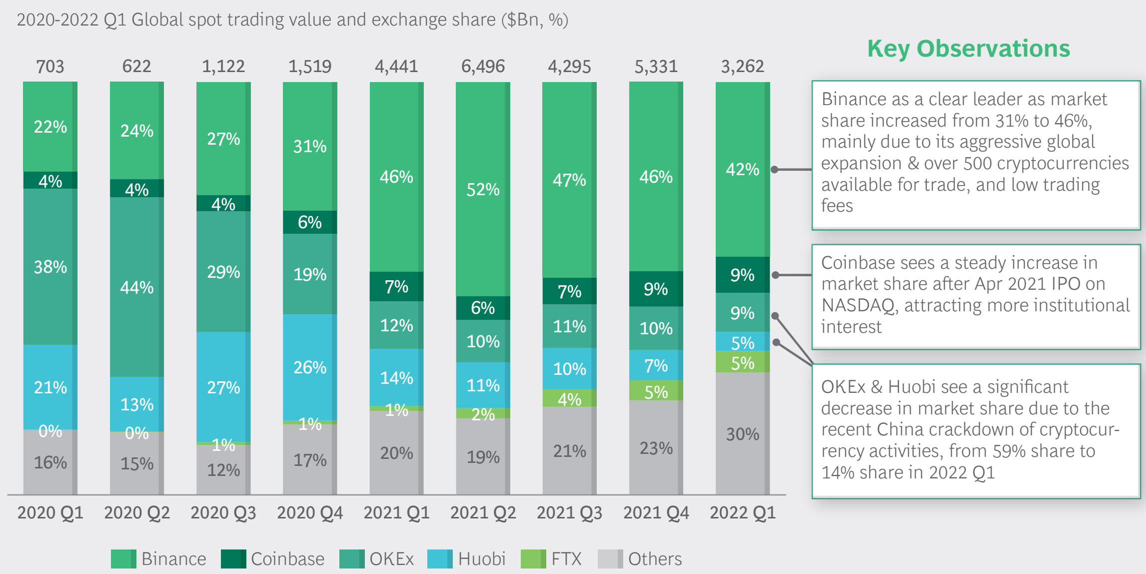
- **High-frequency traders/prop trading firms.** High-frequency traders/prop trading firms contribute about 60–70% of derivative trading volumes. Leading trading firms such as Jump increasingly focus on venture investing, which creates a need for hedging their token-based investments. Arbitrage between exchanges will become increasingly competitive due to increased liquidity and lower slippage. High-frequency traders often find it harder to move money between exchange platforms. Another pain point is that low trading volume often creates wide spreads on certain regulated derivatives products.

- **Corporations/emerging classes (e.g., miner).** Traditional corporations and miners account for less than 5% of derivative trading volumes. Often, they lean toward purchasing large amounts of Bitcoin and retaining them on balance sheets, with no active trading (as Tesla has done). Their pain points, especially for companies that are new to crypto, are that regulatory complexity is challenging to manage. Therefore, many are willing to pay a premium for end-to-end services. We expect this segment to see meaningful growth in terms of adoption of crypto derivatives in the future.

4.3 How Has the Crypto Exchange Competitive Landscape Evolved?

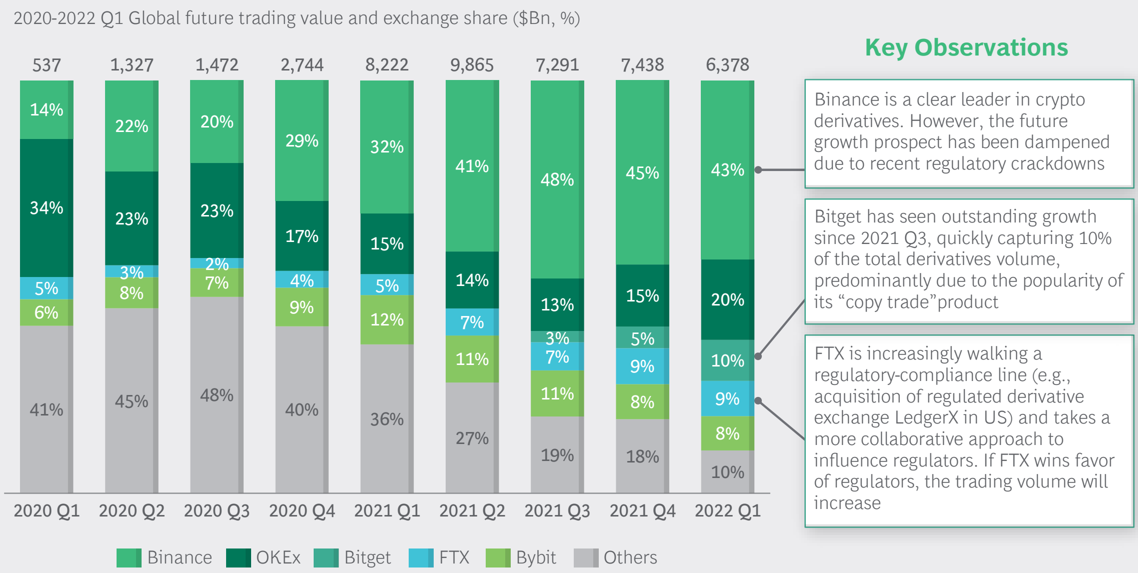
The exchange landscape for both spot and derivatives has seen consolidation. (See Exhibits 22 and 23.) This has been primarily driven by the scale advantages of large players to outperform competitors in exchange key purchasing criteria, and the sparsity of local regulated exchanges, especially in derivatives. The CME is the only major regulated derivative trading venue. Venues such as ErisX, LedgerX/FTX facilitate relatively small volumes. Binance is a clear leader in both spot and derivative markets. However, recent regulatory crackdowns on Binance's unregulated derivatives products could dampen growth in the coming months. Exchanges such as FTX are increasingly walking the regulatory-compliant line and could gain market share if they win the favor of regulators in US and European markets. The US Commodity Futures Trading Commission (CFTC) is currently considering an application from FTX US to offer "non-intermediated" margin trades for cryptocurrency derivatives, meaning that the exchange would bypass the financial companies that currently facilitate such trades. "There has been missing federal oversight of (crypto) exchanges

EXHIBIT 22 | Global Spot Trading Has Become More Consolidating with the Top 5 players Taking ~70% Share of Trading Value in 2022 Q1



Sources: The Block; BCG analysis.

EXHIBIT 23 | Global Derivatives Trading Has Become More Consolidating with the Top 5 Players Taking ~90% Total Trading Value in 2022 Q1



Sources: The Block; Coinglass; BCG analysis.

in the US, we see this as a way to bring our platform under a regulatory agency," says FTX CEO Sam Bankman-Fried.[10]

4.4 What Is the Endgame for Crypto Exchange Competition?

We benchmark against traditional exchanges to better understand the likely competitive end-state for crypto trading. Traditional exchanges went through several phases of consolidation:[11]

- **In-country consolidation.** This type of consolidation aims to achieve economies of scale and cost reduction, and to provide a one-stop solution for the end customers inside a country. Most countries have already experienced in-country consolidation.

- **Regional consolidation.** Regional consolidation usually aims to create a common market within the region. Regional mergers also seek to reduce cost and create regional asset classes (e.g., Southeast Asia equities, Indexes, ETFs, derivatives).

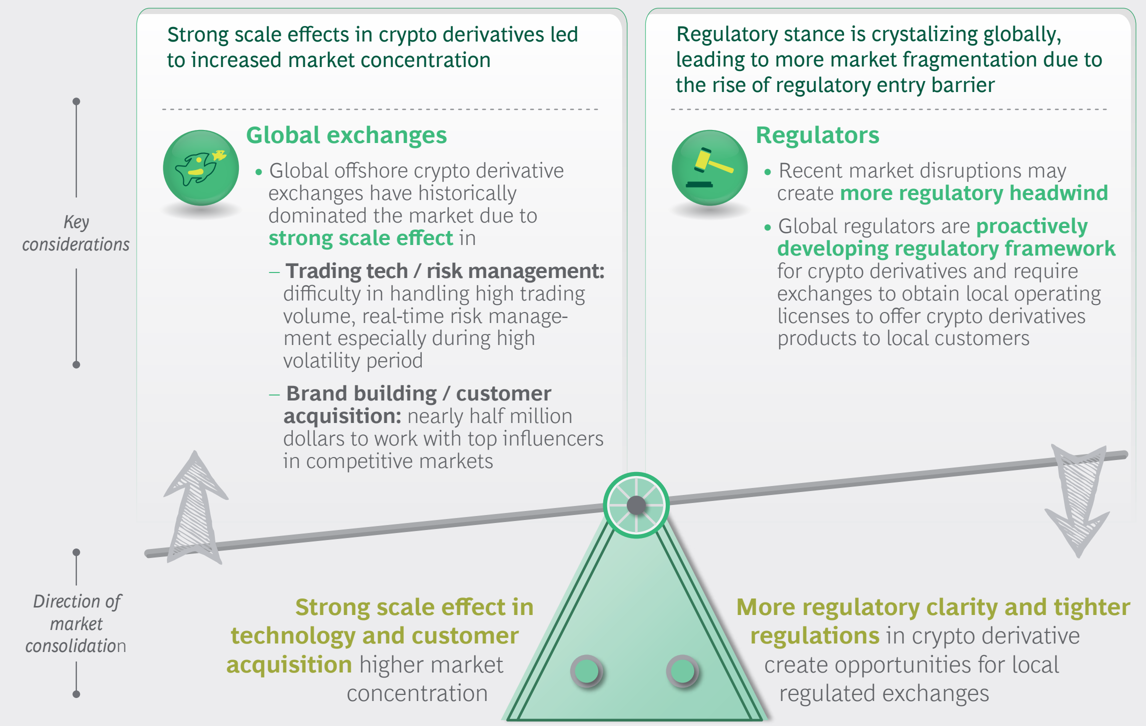
10 See "Reuters: FTX chief welcomes more regulation as CFTC weights its crypto derivatives proposal".

11 See "The CBM Group — Exchange Consolidation: Scenario for Eastern Europe".

- **Global mergers.** More recently, traditional exchange players have sought to become global exchanges that offer a wide range of products across different time zones. The mergers that led to the establishment of NYSE Euronext and Hong Kong Exchanges LME are prime examples of this.

However, the consolidation may be nearing its end as we see high-profile, global mergers failing to gain regulatory approval (e.g., NYSE—Deutsche Börse). Similarly, to traditional exchanges, we predict that the crypto exchange landscape will also be influenced by the ability of players to scale, and by regulations. (See Exhibit 24.)

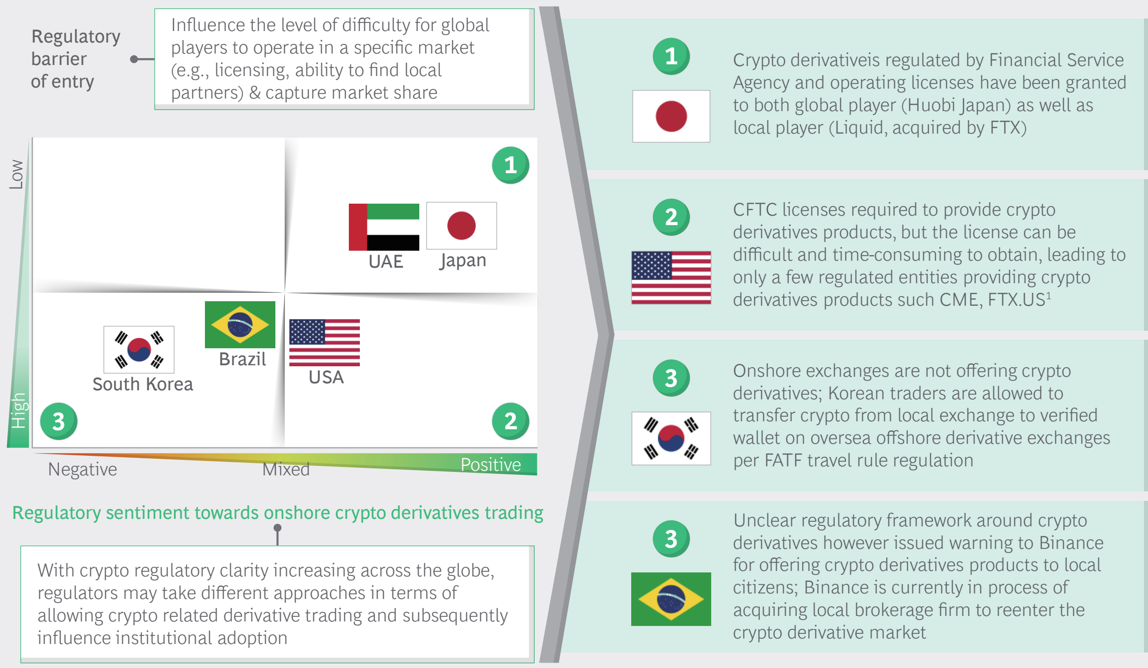
EXHIBIT 24 | Strong Scale Effect Has Led to High Market Concentration Level but Regulations Are Expected to Prevent a Winner-Takes-All End-State



We focus on how crypto derivatives regulations in different regions will evolve and likely impact the market dynamics as crypto derivatives drive significantly more volume and are subject to tighter regulations in most jurisdictions compared to spot.

We predict three regulatory scenarios that will influence the level of market concentration for crypto derivatives trading. These scenarios are defined by regulatory sentiment toward crypto derivative trading and barriers to entry for global players. (See Exhibit 25.)

EXHIBIT 25 | Crypto Derivative Market Competitive End-State Likely Influenced by Regulatory Sentiment and Level of Local Protectionism



[1] FTX.US requires full collateralization of the derivatives products and is now requesting to use "non-intermediated" model to hold customer's collateral directly and liquidate positions held by the exchange on 24-7-365 basis.

Scenario 1 is likely in developed economies such as Japan where there is a more open attitude toward global players. For these markets, global offshore exchange players will quickly move onshore through aggressive M&A. Local players will struggle to compete, due to inferior technological capabilities. They will likely become acquisition targets for global players. FTX's acquisition of Japanese local exchange Liquid is a prime example. The market concentration level in these markets will remain high.

Scenario 2 is likely in developed economies or emerging markets with advanced financial markets, but which are either protective of local players or take a more restrictive approach toward crypto derivatives. In these markets, global offshore players will still attempt to get on-shore, due to potentially large institutional flows onshore. Local regulated exchanges will also have a chance to leverage their existing customer bases to launch crypto offerings. However, these players are unlikely to quickly supplant the crypto exchanges. The crypto exchanges benefit from 1) robust platform technology: crypto exchanges have invested to be able to handle large volumes; 2) agile product development: crypto-native players such as Binance, FTX or Bitget frequently launch new products while traditional exchanges such as CME or Cboe-ErisX still only offer limited products covering the most popular coins such as Bitcoin and Ethereum; 3) crypto exchanges offer lower margin requirements and more margin options (such as coins instead of cash) to allow traders to gain higher capital efficiency; 4) stronger brands: crypto-native exchanges have accumulated strong brand recognition, which is particularly important to crypto retail investors; 5) 24/7 trading: traditional exchanges are still constrained to traditional working hours.

Scenario 3 is most likely in emerging markets, where the traditional capital market is relatively less mature, or where markets and investors have been hurt in the financial crisis. These markets will take a more cautious approach toward crypto derivative regulation and erect higher regulatory barriers for global exchanges. We expect limited institutional flows in the short-to-medium term while retail users continue to flow to global offshore exchanges.

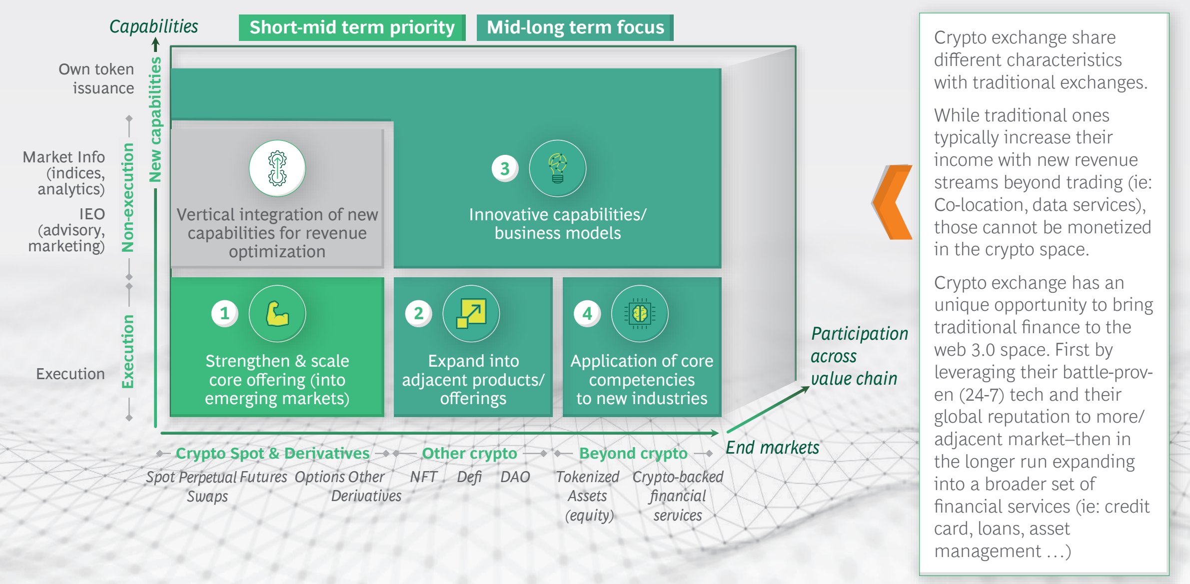
We expect the crypto trading competitive end-state to be similar to the traditional finance market, with scale effects driving consolidation, but with regulatory pressure preventing winner-takes-all situations. Based on the World Federation of Exchange statistics,[12] the top five exchanges facilitated around 70% of the global equity spot contracts and around 80% of the global equity derivatives contracts in 2021. We expect the crypto exchange concentration level to be within a range similar to traditional exchanges. Crypto derivative exchange concentration is likely to be more intense than spot exchange market concentration. In spot, we expect five players to account for about 65–75% of global trading, due to the fact that the exchange also plays the role of "broker," while there are also relatively lower barriers for local players to enter, and local fiat/crypto conversion. In derivatives, we expect the top five players to account for about 80–90% of emerging markets and 70–80% of developed markets, due to the presence of traditional exchanges.

12 https://www.world-exchanges.org/our-work/statistics.

5. Crypto Exchange Playbook for Growth

With crypto adoption on the rise, crypto exchanges should explore different opportunities for growth. (See Exhibit 26.) These are likely to be different to those seen at traditional exchanges, which are often focused on revenue streams related to trading. Data and technology such as co-location services, market data subscription fees and API connection fees for high-frequency traders have been key growth drivers for traditional exchanges in the past few years. Crypto exchanges, however, cannot easily monetize data or technology. Order book and API connections are often made readily available free of charge. Crypto exchanges, conversely, have a unique opportunity to bring traditional finance to the Web3 space. They can do this by leveraging their battle-proven 24/7 technology, and by operating in adjacent markets.

EXHIBIT 26 | Crypto Exchanges Should First Strengthen Core and Then Explore New Capabilities and/or Product Offerings Build



Source: BCG analysis.

We have seen leading players take a series of actions to expand their business, starting by strengthening and scaling core product offerings, and then selectively exploring opportunities in adjacent markets and new industries.

- **Strengthen & scale core offerings (into emerging markets).** In the short-to-medium term, all exchanges should focus on building their core competencies. Platform robustness (liquidity, security, system reliability to handle large trading volumes, and risk management during periods of high volatility), trading pair coverage, lower fees and branding are key factors to success. They also need to scale these core competencies to fast-growing emerging markets where localization is key to win. This includes developing local banking partnerships as they obtain regulatory approvals and licenses, partnering with local influencers to promote brand image, and creating authentic connections with local customers, as well as localized UX/UI and customer services support. M&A will be key to accelerating expansion into new geographies and jurisdictions. Binance, Coinbase and FTX have all implemented M&A strategies, acquiring licensed local players to gain access to new markets.

Bitget: The Path to Growth

Bitget, founded in 2018, became a leading global crypto derivative exchange by focusing on product innovations that cater to the core needs of retail traders. It launched its USDT-margined futures product in May 2019 and became one of the first trading platforms to offer USDT-margined futures and coin-margined futures. In May 2020, it launched its flagship one-click copy trading feature, which leverages social participation and community to enhance the user experience. Retail traders can follow professional traders, and get insight into trade information, strategy, and historical performance. In this way, Bitget lowers barriers to entry for retail users.

By focusing on continuous product innovations targeted to enhance trading experience of its users, Bitget successfully grew its customer base and scaled its offering to over 2 million customers in 50 countries. It saw significant increase in derivative trading value and is now ranked as a top 5 leading crypto derivative exchange in the world.

- **Expand into adjacent products/offerings.** In the medium-to-long term, leading exchanges could leverage their user bases and trading activities to expand their ecosystems and enter adjacent markets. For example, they could expand into the NFT marketplace and other Web3 protocols, enhancing user stickiness by rewarding users with access to investment opportunities for NFTs and other Web3 protocols. Among recent initiatives, Bybit launched BitDAO, contributing 0.025% of futures trading volume to DAO treasuries and engaging platform users to propose partnerships or attract investment to fuel DeFi innovations. Coinbase, among other exchanges such as Binance and Kraken, launched its own NFT marketplace to lower entry barriers to NFTs for their users.

- **Innovative capabilities/business models.** Major exchanges are launching their own exchange tokens rewards and trading discount coupons, or in some cases creating their own smart contract platforms to encourage user contribution and engagement. (See Exhibit 27.) Binance has continuously enhanced the utility of its token utility, starting from "discount coupon" tokens of a CEX to the native token, to two blockchains with increased utility, not only within the Binance crypto ecosystem, but also with off-chain benefits (e.g., Travel, Gift Cards, etc.)

EXHIBIT 27 | Leading Crypto Exchange Tokens Overview

	Exchange Token	Binance -BNB	FTX -FTT	Bybit -BIT	Bitget - BGB	OKEX - OKB	Huobi -HT
	Launch date	Jul 2017	May 2019	Aug 2021	May 2018	Mar 2018	Jan 2018
	Chain	ERC-20 BEP-2B EP-20	ERC-20 BEP-2	ERC-20	ERC-20	ERC-20 OKEX Chain	ERC-20
	Token design	Deflationary	Deflationary	Inflationary	Deflationary	Deflationary	Deflationary
	Token total supply[1]	163 Million	333 Million	10 Billion	2 Billion	300 Million	500 Million
	Discount on transaction fee[2]	~10%	Up to 60%	N/A	~15%	Up to 40%	Up to 50%
Utilities	Staking rewards	✓	✓	✓	✓	✓	✓
	Launchpad	✓	✓	✓	✓	✓	✓
	Voting on projects	✓	✓	✓	✓	✓	✓
	Debit/Credit card	✓	✗	✗	✗	✗	✗
	Transaction fee on own chain	✓	✗	✗	✗	✓	✗

Sources: Company website; CoinMarketCap; BCG analysis.
[1] The amount of coins that have been already created, minus any coins that have been burned.
[2] Transaction fee for derivatives.

- **Application of core competences to new industries.** Crypto exchanges should consider leveraging their core competences to enter new segments. For example, FTX expanded into tokenized stock to provide 24/7 access to US securities markets for users outside the US, and to lower barriers to equity investing by allowing trading of fractional shares (only a few brokers in traditional finance provide such services). FTX US also recently launched its US equities trading services, accepting payments in Stablecoins and US dollars. Traditional financial services are also growth opportunities, especially in emerging markets. Crypto exchanges could actively tap into these opportunities by offering crypto-backed financial services in debit/credit cards, cross-border remittance, lending/borrowing, wealth management and beyond. We have seen major crypto exchanges actively pursuing this growth path to bring crypto-enabled solutions to traditional industries. BitMEX attempted (albeit unsuccessfully) to acquire a German bank, and Binance tapped into the media space with its acquisition of Forbes and by actively pursuing acquisition in industries with monetization opportunities arising from the use of crypto, blockchain and web3 technologies (e.g., gaming, e-commerce and logistics).

6. Conclusion

The crypto exchange landscape is evolving fast around the world, amid rising retail and institutional demand for exposure to the new asset class. This presents exchanges with an opportunity to expand their product offerings and to seek out new territories in which to operate. The evolution of Web3 provides an additional impetus, as it brings disruption and the opportunity to use distributed ledger technologies across a wider range of applications. Already, smart-contract-based coins are seeing rises in trading volumes as a direct result of Web3's potential. As crypto decision-makers consider their options, a vital element of their analysis will be where and how to play. This paper shows that there will likely be value in considering emerging markets, where crypto penetration is already higher than developed markets. Emerging markets offer exchanges the opportunity to serve unbanked populations, to enable payments, and to offer access to earning opportunities. Here we deep-dive into emerging markets around the world, highlighting key growth opportunities across spot and derivatives markets. We also consider the opportunities for global players in that context, in light of a shifting regulatory landscape. The bottom line? Exchange leaders must be flexible and pragmatic about how and where they want to play. However, if they choose well and execute efficiently, there is potential to generate revenue and build a competitive advantage in an asset class that is still at the beginning of its journey.

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About Bitget

Established in 2018, Bitget is one of the world's leading cryptocurrency exchanges. Currently serving over two million users in more than 50 countries around the world, Bitget accelerated its mission to promote decentralised finance in 2021 with a 500-strong workforce spanning over 20 countries.

Since Bitget's official launch in the crypto derivatives market in June 2019, the platform has now become one of the world's largest crypto copy trading and derivatives exchanges and is ranked in the top five globally by CoinMarketCap for derivatives trading by volume. Bitget's flagship product, One-Click Copy Trade, has attracted more than 20,000 copy traders, innovating the experience for crypto derivatives traders worldwide.

Adhering closely to its philosophy of "Better Trading, Better Life", Bitget is committed to providing comprehensive and secure trading solutions to users from all over the world. In September 2021, Bitget announced its sponsorship of world-renowned football team Juventus as its first-ever sleeve partner and PGL Major's official esport crypto partner soon after. Partnerships with the leading esports organisation, Team Spirit, and Turkey's leading and long-standing football club, Galatasaray, were also announced in early 2022.

About Foresight Ventures

Foresight Ventures is dedicated to backing the disruptive innovation of blockchain for the next few decades. We manage multiple funds: a VC fund, an actively-managed secondary fund, a multi-strategy FOF, and a private market secondary fund, with AUM exceeding $400 million. Foresight Ventures adheres to the belief of "Unique, Independent, Aggressive, Long-Term mindset" and provides extensive support for portfolio companies within a growing ecosystem. Our team is composed of veterans from top financial and technology companies like Sequoia Capital, Google, Bitmain, CICC and many others.

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Boston Consulting Group partners with leaders in business and society to tackle their most important challenges and capture their greatest opportunities. BCG was the pioneer in business strategy when it was founded in 1963. Today, we work closely with clients to embrace a transformational approach aimed at benefiting all stakeholders—empowering organizations to grow, build sustainable competitive advantage, and drive positive societal impact.

Our diverse, global teams bring deep industry and functional expertise and a range of perspectives that question the status quo and spark change. BCG delivers solutions through leading-edge management consulting, technology and design, and corporate and digital ventures. We work in a uniquely collaborative model across the firm and throughout all levels of the client organization, fueled by the goal of helping our clients thrive and enabling them to make the world a better place.

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