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SELLING SHOVELS DURING THE CRYPTO RUSH: THE BUSINESS MODEL OF CRYPTO EXCHANGES. EXAMPLES OF COINBASE, CRYPTO.COM AND BINANCE

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ABSTRACT
Leaving aside the discussion of cryptocurrencies as a trustworthy monetary standard while acknowledging their speculative power, this study aims at providing an in-depth understanding of the business model of some of the main cryptocurrency operators. What is their business model, what are their mid and long-term expected growth and market.

A thorough analysis of their business models is proposed via three main techniques: The business model canvas, along with PESTLE and Porter's five forces model to assess the competitive positions of the main operators in cryptocurrency markets. With them, we will depict how, in such a volatile market as it is the crypto one, companies are able to take profit by providing exchange services to consumers and merchants alike.

Keywords: Cryptocurrencies, business model, crypto players, operators, service providers, exchanges.

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1. INTRODUCTION

1.1. Scope and methodology

The aim of this study, called "*Selling shovels in the Crypto Rush: the business model of crypto exchanges. Examples of Coinbase, Crypto.com and Binance"* is to analyze the business model of crypto exchanges. I will try to understand their functionting via a Business Model Canvas, then studying their environment via a PESTLE analysis, and last, analyzing their industry according to Porter's 5 forces model. Last, a brief reference to the Blue Ocean strategy will be done to better illustrate the interest in this market. This work will be rather descriptive, as it dives deep into the gears and nuts of this type of companies. Sources compiled are mainly academic for the methodologies used and of actuality in the analysis itself. A long work of personal creation has been performed in the analysis, as these companies have not yet been subject to study very often. Also, their opacity in numbers and press releases leaves much to personal interpretation The remaining of this essay is structured as follows: first, a brief introduction to the crypto environment and industry will be made. Second, section 2 will analyze and consider all the factors that conform the business model of crypto exchanges via the business model canvas technique. Section 3 will analyze the environment of the crypto industry in general and of crypto exchanges in particular. This task will be performed based on a PESTLE Analysis. Then, section 4 will take charge of the industry of crypto exchanges itself and study the rivalry among competitors, by the means of a Porter's 5 forces analysis. Last, a brief reference to the blue ocean strategy in the crypto exchange industry will be made.

1.2. Brief introduction to the industry

Although there were some predecessors, it was in 2008, when the white paper called *Bitcoin – a Peer to Peer electronic cash system* was published by an unidentified author under the alias 'Satoshi Nakamoto'. The paper proposed the idea of a decentralized currency, the Bitcoin, designed as a peer to peer payment means that would not need of the fiduciary effectiveness – that is, the reliability that brings them its exchange value –, thanks to an automatic validation system based on cryptographic puzzles. Unlike *fiat* money, the value of Bitcoin and other cryptocurrencies is not backed or controlled by governments. Exchanges would be fully validated by a network of the so-called *miners*: highly powered computers that are devoted to solve those cryptopuzzles that turn increasingly difficult as more coins are *mined*, with the reward of receiving Bitcoins in

exchange of such work. Last, but not least, Bitcoin would be, as it is any natural resource, limited to a 21 million.

Whether Bitcoin or any other cryptocurrencies will eventually surpass *fiat* money as an international payment means is subject to multiple unknowns: is the mining network as reliable as it looks like? Is there a leadership of *early adopters or deep-pocket 'whales'* capable of exert some kind of market manipulation? What will happen once those 21 million Bitcoins are mined? All these issues remain unsolved today. In the meantime, there is much to be done: while at the point of its creation a Bitcoin was worth 14 cents of a U.S. Dollar, at the date of the writing of this paragraph (May 8th, 2022) a single coin accounts for USD 34.474,20. The speculative nature of Bitcoin is an inherent characteristic of this currency. Moreover, other crypto coins and networks have utterly emulated the Bitcoin system, as it is the case of Ethereum or Thether, remaining Yakamoto's creation as the flagship of the crypto landscape.

Moving one step further, this work will be leaving aside other issues of interest that surround the crypto environment, strictly setting the focus on the business opportunities of crypto exchange operators. For that matter, all the unknowns regarding, for instance, the possibility of Saifedean Ammous' (2018) piece *"The Bitcoin Standard: The Decentralized Alternative to Central Banking"* turning into a reality any time soon will be left apart. Moreover, it is the existence of an innate volatility under these crypto-assets that is serving speculators and allowing certain players – as if it were the new Gold Rush –to build wealth. As in the saying, "during a gold rush, sell shovels", certain companies are profiting from the growing interest in these currencies, be it by setting *mining* servers; offering custody/deposit services; leveraging the blockchain network to, as an example, certify diplomas; or many others. Last, but not least, – and actually, they are the best-known *shover-sellers* by the general public – there are certain players providing different exchange services that serve users who want to operate crypto. For that reason, the objective of this paper is to evaluate the business model of those profiting from shovel sales in the form of crypto exchange. Unavoidably, the potential is astonishing: Coinbase, the largest cryptocurrency exchange and which happens to be publicly listed in the New York Stock Exchange, appointed revenues of $483M in 2019, growing to $1.14B in 2020. More numbers: with a 41% profit margin, they had $322M profits in 2020.

Throughout these lines, I will examine, from an analytical/strategic point of view, how players of the Crypto industry in general and some crypto exchanges in particular are making business out of the global growing crypto appetite. The three subjects of analysis

will be Coinbase, Crypto.com and Binance. Reasons for this choice are mainly operational for the cases of Coinbase and Crypto.com, and economics in what refers to Binance, as it is the largest by volume in crypto exchange worldwide. Despite the choice of the aforementioned, other key players will not be taken into account for the sake of this study but ought not to be disregarded. As an example, the Bahrain-based Rain is one of the main exchanges in Asia. Moreover, the global reach, brand awareness and business size of the three companies of analysis provide a significant enough amount of information to conduct the evaluation.

In order to perform such a study, some classic strategy analysis tools will be used. First, I will depict a **business model canvas** able to explain the **common parts and particularities of the three of them**, in order to provide a better understanding of what they do. Second, a **PESTLE analysis will be performed to examine the environment**. This will help us as well demonstrate how they have been able to create **a blue ocean strategy.** Third, a **PORTER's 5 forces analysis** will let us go through the differences between them and determine their relative positioning in the crypto exchange market. Last, a **small reference to the Blue Ocean strategy in their industry** will serve us to evaluate the current situation and opportunities it has.

2. THE BUSINESS MODEL

2.1. Exchange of Crypto

2.1.1. Buy, Sell & Hold, Exchange fees

The Crypto economy as a whole is based on one premise: those who serve the network, who take the role as blockchain connectors in the verification process of every transaction that takes place, will receive a profit from such a service. Those are, the network fees. On average, they tend to be as low as 0.5%. This is indeed one of the sources of attractiveness of the crypto service: while a general processing fee of a credit card payment service ranges from 1.3% to 3.5%, and with other digital payment service providers like PaySafe charging as much as a 12%, Coinbase has a flat 1% processing fee for all its merchant transactions; Crypto.com can charge as little as 0.036% + the network fee; and Binance's transaction fee is of only 0.0% to 0.35% + network fee per transaction. Such difference, in a high-volume, high-exchange market, makes transaction fees the main source of income of these companies. That, along with the crypto appetite that only keeps growing,

with a market cap at date October 2022 accounting for $924.14B, puts exchange services on the crest of the wave. Crypto exchanges add value to their environment mainly out of three reasons First, accessibility, by allowing users to store or make transactions on crypto via their own service, without the need of an actual crypto wallet, and with all the due management it requires. Second, security, as scams, fraud, hacking or fishing are growing practices in the crypto scenario, and these companies will offer anti-attack assurances that provide users with further security. Third liquidity, as they are big enough to allow single users to buy portions (splits) of coins, avoiding the bargain of paying +USD30.000 to obtain a whole coin, or simply by providing accessibility to coins that are hardly reachable without them. For all these reasons, crypto exchanges create a monopoly effect – as indicated by Huberman, D Leshno, and Moallemi (2021) without a monopolist, and therefore their exchange services are key to the crypto environment. Further details of their value proposition will be examined in the forecoming lines but, as an indicator of the relevance trading fees have on their earning statements, transaction revenue accounted for 85% of $1.8 billion in total revenue of Coinbase in the 2021 exercise.

2.2. Buy, Sell and Hold – Other non-trading fees

Besides the easily understandable trading fees that are cashed every time a user makes a transaction in their platforms, professional users, institutions or crypto environment partners have a larger spectrum of options for which crypto exchanges will charge them. While the aforementioned 85% of Coinbase's total revenue is indicated to come from trading fees – meaning, transaction revenues –, even a listed company does not have the obligation to reveal its secrets. Therefore, we cannot know so far which part of the cake comes from other type of fees besides the classic "*send & receive"* ones. The point to be taken into account here is that there are more services than the classic Wallet-to-Wallet transaction fees, for which the exchanges will charge their customers and merchants. A classic case of these would be investor's fees, which although lower than end-customer ones, are usually composed of more complex services for which exchanges will take a portion. These are, among others, stop-loss and take-profit actionability options or crypto future and options packages. Moreover, some of them, as it is the case of Bitpay – a digital payments platform focused on the use of crypto as a payment means – charge a settlement fee in order to settle the daily price of the coin versus USD, taking an extra profit on holders.

2.3. Subscriptions and other diversification techniques

2.3.1. A reference to the role of ICO's and how exchanges monetize them

ICO's, acronym for Initial Coin Offerings, are to the crypto environment what Initial Public Offerings are to listed companies. Already compared to the gold rush by Wu-Yi Koo (2022) in its Case Study from INSEAD Publishing, they served as an unregulated way to crowdfund coins with the expectations of getting in return the next Bitcoin. Generally custodised under the blockchain of Ethereum – in 2017 more than 90% of ICOs were based on it – the launch of new coins was a way for traders and speculators to enrich themselves quickly, even surpassing total Venture Capital funding globally – CBInsights (2019). This was something that exchanges like Binance quickly took profit on. In fact, part of the recipe for Binance's success was the possibility of accessing certain still niche coins which high potential growth, therefore leveraging their trading frequency into trading fees.

Moreover, it is not only the trading fees that allow exchange players to create value on ICO's, but the partnership with institutional players themselves by providing an ecosystem for coin launches from which they can benefit. There are three main sources of income that allow these platforms to benefit from Ecosystem partners, besides the classic Buy, Sell & Hold: distribution, building, and payment. Distribution is the service provided to asset issuers to allow their coins to be in circulation in their system. Taking into account that, as already inferred by Huberman, D Leshno and Mollemi (2021) in their paper *Monopoly without a Monopolist: An Economic Analysis of the Bitcoin Payment System*, these exchanges are the place to be for the aspiring new coins, and therefore the ideal breeding grounds for new launchers. Second, the ability to *Build* those coins under their own chain of blocks provides an option to many ICO aspirants; and finally, the fee-based payment system that such chains enable bring more revenues to the exchange's cash flow.

2.3.2. Storage

The so-called *cold storage* is a way of holding cryptocurrencies offline, aiming at preventing hackers' attacks. By the use of encrypted hardware, companies like Binance, Coinbase or Crypto.com store their assets in units relatively more difficult to be hacked. Besides their own crypto coins and their core services of trade intermediation to

customers' they offer such services for institutions and environment partners that would like to keep their assets safe, right as banks custodized money for other entities. Via storage fees or via subscription services, exchange companies monetize these custodial services.

2.3.3. Borrow & Lend

Like regular banks offering Margin Accounts to other players, the crypto ecosystem has developed so much that professional crypto portfolio managers have emerged, using the well-known techniques applied by more conventional traders, and of course needing of partners able to lend them money to leverage. In the form of collateral, fees, or revenue shares, exchange companies are able to add value to their portfolio by helping others operate theirs.

2.4. Playing Home: the role of legislators

A comprehensive analysis of the business model of exchange operators must acknowledge the importance of legislation within the crypto ecosystem. As expected, regulation varies vastly among countries. Within our subjects of study, Coinbase has been characterized by a compliant trajectory, even going to public as NYSE listed company. This fact reveals Coinbase' target scope by focusing in the US market as a strategic target. Alternatively, Binance has been stumbling around for quite some time: it moved from China to Japan as a consequence of the China's crypto ban in 2017, and also due to the links that its founders had to the nation of the rising sun. Later, due to discrepancies with Japan's Financial Services Agency, the Prime Minister of Malta tweeted a message welcoming Binance to their new home. However, after two years seeking a clear to settle an agreement with Malta's authorities[1], Binance decided not to continue their negotiations with them, moving the headquarters of the company to the world's best-known offshore company house: the Cayman Islands. Finally, Crypto.com sited its headquarters in Singapore, a leading Asian tiger famous for their substantial development of holding companies and investment vehicles.

[1] This conversation and approach served the Maltese government to utterly bring other players into the island.

2.5. Marketing and presence efforts

Crypto ecosystem, as any other relevant social phenomena, has defenders and detractors. Huge volatility of prices, lack of fiduciary power, and the idea of a decentralized financial service itself casts serious doubt on cryptos' credibility. So does on their exchange platforms. As a countermeasure, the marketing expenses of these companies has not stopped increasing. Through marketing and positioning, they make efforts to increase exposition and credibility, while attracting new customers. As an example of this, let us think of the branding of the used-to-be-called Staples Center in Los Angeles, home of the Los Angeles Lakers and Los Angeles Clippers NBA teams. After 22 years under such name, the famous stadium that saw Kobe Bryant win five NBA rings changed its name on December 25th, 2021, to be now called Crypto.com Arena, after a 700 million dollars 10-year contract. If famous bank institutions sponsor other stadiums – as it is the case of the Chase Center in San Francisco or the UBS Arena in New York – in a simple call, why would Crypto.com, sponsor of one of the main stadiums in the US, not be as reliable as they are? Diving deeper in the sports sponsorship industry, in the case of Formula 1, the examples are shocking. *The Big Circus*, as it is often called, is known to attract some of the wealthiest individuals on Earth to its Grand Prix, usually populated by wealth management bank commercials, B2B services advertising, and luxury goods product placement. In the 2022 season, eight out of the ten teams in the competition are already sponsored by some Crypto company (See Exhibit 1). Moreover, the brand-new jewel of the F1 season, the Miami Grand Prix that took place on May 2022 for the first time, was fully sponsored by Crypto.com, receiving the official name of *Formula 1 Crypto.com Miami Grand Prix 2022*. Usually having brands like Rolex, Aramco, or Pirelli as the GP's main partner, Crypto.com positions itself as a solid company with an alike trustworthiness.

On another matter, we may not forget the sales, business development, customer service and account management efforts that ought to be done by these companies. Attracting new individual end-users is one thing but another completely different one is bringing B2B or B2G clients. In the case of the latter, with a longer pipeline of a sales process, not only the marketing acquisition efforts but the sales, business development and account management efforts as well must grow in order to handle leads and convert them into new business partners.

2.6. The Business Model Canvas

2.6.1. Introduction to the Business Model Canvas

The Business Model Canvas, a technique first proposed by the Swiss business theorist Alexander Osterwalder (2010), is an analytical approach to the business model of a company. Applicable to nearly every industry, it displays in a simple, visible way the apparatus that a business uses in its aim to bring value. It is not trivial that it poses the *Value Proposition* at the core of the canvas.

A *canvas* is a cloth normally used in painting as support for the pigments, which combined in a specific way, will define a unique painting. Same way painters project their art in a canvas, business creators ought to develop a combinations of pigments – each of the segments of a canvas – to depict what will eventually become a fully functional company. As if it were a classic painting perspective, the business model canvas in its template form organizes the different segments in a specific way. At the center of the canvas, we will find the *value proposition*, which will be the cornerstone of the business itself. To the left, we will find the three *keys*: *key activities, key resources, and key partners*. The *key activities* will refer to the actual offering of the business, bringing to Earth the ideas delivered in the value proposition. Provided that matter is not created or destroyed, only transformed, below those we will find the *key resources*, which will provide the necessary tools to offer the aforementioned activities. Moreover, in the top left of our canvas, we will find the *key partners*. These partners, in a general business definition, will represent those stakeholders that contribute to our value proposition in some way, which may or may not be necessary for our activities. Second, if we look at the right part of the canvas, we will see how it outlines the *customers.* These are, simply, those to whom we will project our value proposition aiming that they are attracted to it. At the nearer right, we will have the *customer relationships*, which represents all the possible ways in which we will connect with existing, previous or future/potential customers. Below it, again the business model canvas aims at bringing to Earth such relationships, defining the actual *channels* that will be used. In a more and more connected world, this activity becomes key to any venture. Last, on the top right of the canvas, we will find the *customer segments*. Reaching customers is a crucial activity, but even more crucial it can be to reach the ‘right’ customers. As it is often said, it is not only about increasing the numerator, but also about decreasing the denominator. The

segmentation of customers will help businesses choose the right audience to optimize their communication and marketing efforts.

Finally, we may not forget that one of the main objectives of any company, if not the only one, is to have profits. Leaving aside the specifics of double-entry accounting, there is a basic formula to remember: *Revenue* minus *Cost* equals *Profit*. For that reason, at the bottom of the Business Model Canvas, we will have a two-sided bar with the two subjects of analysis in the profit-making: *Cost Structure* and *Revenue Stream*

2.6.1. *Crypto Exchanges' Business Model Canvas*

Table 2.1. Business Model of the Crypto Exchanges

Key Partners

Governments and **Financial regulating entities:** a must-have relationship that brings security and continuity to the crypto environment and the exchange themseves
Crypto Portfolio Managers and professional investors: in a two-side relationship, they serve both as customer and environment partners to the exchanges.
Server providers: for both allowing the system to pass trades but also the hosting of the cold storage
Legal firms: required for administrative inquiries in the relationship with stakeholders, primariliy goverrnments and institutions
Lobbying firms: groups of pressure driving adavances in the crypto acceptance of governments
Card suppliers (Visa, MasterCard): allowing customers to have their own crypto-based debit cards in some cases
Banks and other financial institutuons: providing support to crypto exchanges in the transfer of money, considering them as a general source or even helping in the exchange of information and AML prevention.
Companies, institutional investors: The crypto environment highly relies on its trustworthiness. The more companies accept payments in crypto, or the more professional investment institutions trust crypto, the more people will see it as an option.
influencers and key voices of the environment both in the academic and in the media field, people with a large recognition in the field create and develop trends that shape the industry. The clear example is the case of Elon Mask and his famous tweets that shake the price of certain coins.

Key Activities

Transfers
Custody
Storage
Borrowing
Trading allowances
Distribution
Marketing
Business Development
Sales
Account Management

Key Resources

Own network
Access to networks
Access to coins
Online system
Apps
CRM management
Servers
Cold storage
Employees - mostly technicians, marketeers and salespeople
Offices
Public registry and financial licenses
Legal services
Lobbying

Value Propositions

Security: crypto exchanges are more secure environments than the regular block of chains networks to store and place orders, often having assurances covering for certain amounts and of course largely-developed anti-hacking services
Accessibility: for both end-customers and professional ones, accessibility is key. The complexity of the blocks of chains is not for everyone and the ease of creating an exchange-managed wallet is incomparable to the bargain of having a self-managed wallet
Liquidity: the large amount of trades placed allows the purchase and salle of coins with ease, not requiring in most case the acquisition of a whole coin but allowing instead the split of them
Access to tokens: niche tokens, particularly in their IPO momentum, are highly attractive to investors and individuals. Exchanges facilitate the purchase and sale of those by including them in their trading portfolio
Access to networks and own network: for the case of coin managers, accessing a network (a blockchan) to host their coin is key
Distribution opportunities: again, coin managers use these platforms to distribute their new creations
Cold storage: complex, more secure storage based on encrypted hardware
High-quality trading options: professional traders need of specific type of orders to maximize profits, these exchanges allowing them to place such
Trading allowances: by lending money for trading after a collteral, exchanges facilitate professional investors and portfolio managers the placement of high-leverage orders
ICO opportunities: investors, portfolio managers, individual users and coin managers take profit – or losses – from a highly-developed niche coin environment where the early adopters usually take the large portions of the cake

Customer Relationships

Marketing
Customer acquisition
Subscription services
B2B & B2G sales
Emailing and re-marketing techniques
Apps and their notifications
Account Management
Client support services
Customer services
Complaint-dealing
Lawsuit-dealing

Channels

Brand awareness
Marketing acquistion
Campaigns
P2P Reccommendaitons
Social networks
Branded content
Events & congresses
B2B & B2G sales

Customer Segments

Individual customers: low frequency crypto investors. Main revenues come from the purchase and exchange of coins. Normally have a exchange-managed wallet and place trades via their exchange account
Highly-engaged individual customers: higher engagement individuals that may place trades, use stop-loss and take-profit services, take place iin ICOs as early adopters of the coins, or often have crypto-based debit cards and subscriptions. May have a exchange-managed or a self-managed wallet
Professional investors: frequent holders of large ammounts of coins, providing revenues in the form of storage fees or custody fees
Portfolio Managers: order-launching or order-executing traders that use specific order types and often borrow amounts to place trrades providing a collateral. use futures or options
Coin Managers: developers of new coins that use the exchange's network to host their coins, or simply to distribute them. Revenues come via those two service fees mainly.
Miners: often require custody or cold-storage services to protect their large amounts of coins
Institutions: certain banks and central banks are already holding cryptos as a reserve of value, frequently requiring a exchange partner to host their assets

Cost Structure

What are the most important costs inherent in our business model?
Which Key Resources are most expensive?
Which Key Activities are most expensive?

IS YOUR BUSINESS MORE
Cost Driven (leanest cost structure, low price value proposition, maximum automation, extensive outsourcing)
Value Driven (focused on value creation, premium value proposition)

SAMPLE CHARACTERISTICS
Fixed Costs (salaries, rents, utilities), Variable costs, Economies of scale, Economies of scope

Revenue Streams

Buy, Sell & Hold fees
Distribution fees
Trading services
Storage services
Trading allowances
Card fees
Other non-trading fees
Holding fees
Hosting services
Borrowing services
Subscriptions

3. THE ENVIRONMENT

3.1. PESTLE Analysis, an overview

The PESTLE Analysis (Aguilar, 1967) is a framework widely used in strategic management to evaluate a company's or industry's macro-environment. It is key to emphasize that such an analysis will focus on the external factors that may affect a business, leaving aside all the inner aspects that ought to be controlled by management. Its name, PESTLE, is the acronym of the six forces subject of analysis: Political, Economic, Social, Technological, and the utterly added, Environmental and Legal. Depending on the type of business, some of them may gain importance among the others. For such an industry as crypto-exchanges, it is my belief that the social force, – and in a smaller portion, the political, social a, legal and technological – will have the largest relevance. Such a statement is based in that the adoption of cryptos by institutions and individuals strongly relies on their credibility, that is, a social factor widely dependent on legal and political aspects. That means, if no person, institution, government, or company believes in the inner power of crypto as a value reserve, they will not prevail as a payment means either and therefore the exchange of cryptos will not be attractive to investors nor users. On the other side, the environmental aspect analysis of the crypto exchange service is of course of relevance, however not crucial. Moreover, if we look at the energetic consumption of crypto-mining techniques, it can clearly be a concern for many. However, as this is at the moment only a side-effect of a global phenomenon, I will later explain how it is not as crucial as other aspects are.

3.2. Political force

Political force refers to the decision-making and government tendencies that take place. Normally dividing national guidance into three powers – executive, legislative, and judicial ones – we will put the focus of the political environment in the executive power, leaving the legislative and judicial ones for the sake of the *Legal force* analysis. More specifically, we will think of the political environment as what the laws and regulators devise, strictly looking at the big picture, while the legal one will analyze how these decisions are finally implemented.

In what refers to cryptocurrencies, politicians worldwide have demonstrated multiple and shifting viewpoints. As a visual overview, we can look at Exhibits 2 and 3, corresponding to maps developed on the paper "Regulation of Cryptocurrency Around the World:

November 2021 Update" (The Law Library of Congress, 2021). They show how certain countries opted for a total ban of cryptos, as it is the case of China or Algeria. Also, some of them have shown an *implicit ban*: in the case of the United Arab Emirates, they have not strictly banned them, but do not accept their use as a payment means. Some cases are more severe, as it is in Vietnam, where usage of crypto-payment platforms can be prosecuted and have administrative or even criminal penalties. Moving forward to those nations where cryptocurrencies are regulated, we will find how main efforts come in the sake of anti-money-laundering (AML) regulations, acceptance of cryptocurrencies as a payment means, and taxation of cryptocurrency gains. The superlative example is the case of El Salvador, a central-American country with a population of barely 6.5 million people which, as many others, did not have a currency of their own and relied on the U.S. Dollar as their fiat instrument. In September 2021, president Bukele announced the unprecedented decision of implementing Bitcoin as a national currency. An experiment that only the future will proof right or wrong.

Overall, the political factors are favoring crypto adoption in the largest economies. Besides China – where crypto exchange has been banned since 2017– and Brazil, which only imposes taxation on it, the top 10 World Economies have implemented some kind of regulaton. The fact that this is a good symptom is clear: through AML, taxation, or counter-terrorism policies on cryptocurrencies, they are receiving a similar treatment to other currencies. As if they were U.S. Dollars, Swiss Francs or Brazilian Reals, they are tracked in order to prevent criminal activities and tax capital gains. This brings them the required credibility to be used as any other value reserve or a payment means. Nonetheless, we should not forget that the political factors, in developed democracies, will always be based on social development and acceptance of cryptocurrencies. Electors claiming crypto-acceptance are prompt to have decision-makers likely to regulate in their favor. However, it is their job as well to protect customers and prevent potential frauds or malpractices.

3.3. Economic force

At first sight, not much can be told about the crypto environment after looking at the economic situation. Technically, cryptocurrencies are meant to be a global currency that, generally speaking, do not rely much on economic indicators. However, when taking a closer look at them, as in the study *Exploring the dynamic relationship between Bitcoin and commodities: New insights through STECM model* by Moussa, Mgadmi, Béjaoui and

Regaieg, (2021), there is certain correlation between them. When analyzing the relationship between the logarithmic prices of gold and Brent crude oil and that of Bitcoin, there looks to be "a significant long-run equilibrium links for Bitcoin, which seems to be asymmetric and nonlinear". Moreover, looking at inflation rates, some coins behave as inflationary assets while some others behave as deflationary. However, cryptocurrencies' valuations in the last few months (Q1 and Q2 2022), apparently represent a negative correlation between coin prices and inflation.

As a consequence of this evidence, and particularly of the non-transitory inflation the world largest economies are facing in 2022 – with a predicted stagflation coming soon – it looks like crypto exchange volumes may see a downward trend in the coming months.

3.4. Social force

As indicated before, the social environment plays a key role for crypto exchanges. As any other phenomenon, cryptocurrencies strongly rely on their acceptance to survive: the more people believe cryptoassets are worth the attention, the more volume will be transactioned and the more revenues the exchanges will have. So, how is crypto acceptance evolving? According to the report from TripleA Global Crypto Ownership data, global crypto ownership rates at 4.2% on average worldwide. More data points from this study reflect on the demographics of crypto ownership: 63% of crypto owners are male, 37% female. 72% are aged under 34. 71% have a Bachelor's degree or higher. The consequence of the age distribution is clear: it is the coming generations that are investing on cryptos, so their acceptance is only expected to grow.

Moreover, when we look at the merchant side, interest is outrageous. As indicated on Deloitte's Merchant Adoption of Digital Currency Payments Survey – Deloitte (2022), 85% of the surveyed executives across different industries "*anticipate that digital currency payments will be ubiquitous in their industry in 5 years".* Despite that, 63% of the aforementioned respondents also display a high level of concern regarding crypto payments. Having said that, as in every disruption, there is supporters and haters alike. Nonetheless, the near future looks appealing in what refers to crypto adoption, so the so-called *Social Force* looks like it will favor our subject of study, crypto exchanges.

3.5. Technological force

When it comes to technology, it is clearly at the cornerstone of the crypto value proposition itself. The blockchain technology, understood as the database-computing system that enables cryptographic verification of ownership and traceability of transactions, is a technological advance itself. The use of such technology when applied to money exchange, is a consequence of it. But, if we are talking about money, what happens when technology fails? Hack prevention and performance assurance are some of the main concerns regarding crypto exchanges.

When it comes to attacks, a growing currency is no less than any other. For such reason, attacks like 2018's one to Coincheck, when the Japanese exchange had losses worth $534M, make huge damage to the industry. Another, probably more recognizable example is when, in 2019, hackers withdrew 7000 bitcoins from Coinbase's hot wallet. Leaving aside the reputational effect on the currencies, hacks are a main concern for crypto exchanges, and its prevention will be a large cost in the coming years.

Second, server capability is an issue when it comes to cryptos. Not only regarding how much the exchanges can support, but also how much the network is sustaining. With more and more developed cryptographs, the technological effort to maintain the different networks keeps growing.

Second, a lesser identified but potentially more tragical threat when it comes to technological events, is private key protection. Private key protection relies on the near-impossible ability to identify private keys via the public blockchain keys. Despite that, certain IT tools – as it is the case of quantic computing – might turn this into a possible practice. A quantic computing would multiply the amounts of password combinations a computer can try in order to enter the system. By an immense amount of tries, in theory, a quantic computer would be able to crack the blockchain and come up with real access keys. Such a thing would have disastrous consequences for cryptocurrencies, at least the way they are programmed ad this point. Although a rather unfeasible possibility, it could be a definite *black swan* that risks the crypto environment. Some studies indicate that a 2330 qbit-powered computer would be able to crack the blockchain's cryptography. As this is hard to imagine these days, we will not dive deeper into this possibility, however it is always interesting to bare it in mind.

Last, fraud-prevention efforts and the development of Know Your Client protocols *are* to be taken into account. Often thought as a haven for fraudsters, narcos, or black-market

dealers, crypto exchanges need to keep developing the needed technology to assure traceability of assets.

In short, the technological force is for crypto assets a double-edged sword. It is its flagship value proposition but, if it were to fail or be proven to be used for unethical means, it could cause trouble to every player in the exchange industry.

3.6. Environmental force

Crypto mining consumes lots of energy, agreed, but how much energy does sending a single email consume?

A recurring topic when it comes to crypto is the repercussions that crypto mining have on the environment. The more we advance on the blockchain, the more energy super-servers require to *mine* coins and the least sustainable the so-called crypto-farms – huge facilities filled with mining computers, very prominent in China – will become.

However, let us evaluate the aforementioned statement: a study by Kohler and Pizzol (2019) estimates that Bitcoin's mining produced 17.29 Metric tons of carbon dioxide in 2018. On the other side, according to eco2Greetings (2020), sending a single email produces 4 grams of carbon dioxide. Thanks to the calculations from the Remoov (2022) article2, we can easily infer that, with 280 billion emails sent each day, the daily emissions of carbon dioxide are of 1.12 million tons. The comparison is astonishing. Moreover, we see more and more developments in Corporate Social Responsibility when looking at the different crypto exchanges, even some of them coming up with "eco-friendly" coins, as is the case of Bitgreen or Solarcoin. In fact, one of the arguments that contributed to the decision-making process of Ethereum switching from the Proof-of-Work to the Proof-of-Stake algoritth is its energy requirements, being the second much less energy-consuming.

Leaving aside the difficulties in actually measuring the carbon footprint of different activities, to my opinion, the energy consumption argument is nothing but an attempt in creating disbelief in the crypto adoption.

3.7. Legal force

As previously indicated on the *Political force* analysis, the Legal focuses on the different regulations and how they are implemented and enhanced, while the Political looks at the big picture and the executive decisions made by nations. In this case, to simplify the

analysis, we will focus on the regulations and government agencies of the United States and the European Union in what refers to crypto exchanges.

In the case of the United States, crypto exchanges have been assimilated to banks under the Bank Secrecy Act, and ought to comply with the regulations of the Securities and Exchange Commission (SEC). Moreover, they are considered as the so-called "Money Service Businesses" (MSBs) under Federal Law. When referring to the sale and transfer of investment assets such as future, options, swaps or other derivatives, they are subject to regulation of the Commodity Futures Trading Commission CFTC under the Commodity Exchange Act. When it comes to taxation, the Internal Revenue Service (IRS) considers Bitcoin and other cryptocurrencies as a "property" and not "currency", as stated on IRS Notice 2014-21, Guidance on Virtual Currency. When it comes to taxable gain or loss, the IRS indicates it is recognizable at the moment of its conversion to another cryptocurrency. Last, when it comes to Anti Money Laundering prevention, the Financial Crimes Enforcement Network (FinCEN) regulates crypto exchanges as Money Service Businesses under the Bank Secrecy Act.

When it comes to the European Union, there is currently a proposal for a EU Regulation. Regulations in the EU have binding power and therefore ought to be implemented within a certain time in every respective country, however they tend to be very lax. The so-called MiCA (Markets in Crypto Assets) will provide a harmonized legal framework for the crypto standards. Moreover, the Transparency of Funds Regulation (ToFR) recently approved included certain aspects regulating crypto assets. Among others, first, all the crypto transfers must be traced to a certain identity (zero-threshold traceability); second, service providers (e.g. crypto exchanges) will have to notifty authorities about the identity of both emitter and beneficiary of a transfer; third, every company providing crypto services must be compliant under the AML regulation of the respective nation of operations; fourth, the non-custodised wallets must follow the same regulations and every transfer shall we tracked and identified as well; fifth, reinforced compliance assurance measures will be applied when EU service providers do business with non-EU companies; sixth, all personal information will be subject to European Global Data Protection Regulation (GDPR); and last, service providers acting or transferring money on behalf of other service provider will have to comply with the same regulations.

As a consequence of all this, USA and EU regulation is growing, but it is leaving room to further development of crypto exchanges. Treating crypto service providers as any other financial service provider when it comes to taxation, data protection, anti-money-

laundering or fraud prevention are just measures that further develop the idea of crypto as a payment or value exchange means, which favors their growth.

3.8. Conclusions

To conclude with this PESTLE Analysis, I would suggest that the mid-term future of crypto exchanges looks favorable. Although the current inflation lived in 2022 has impacted the savings – and therefore the crypto investments – of households, thinking of it as a cyclical phenomenon, we should soon see a raise in crypto adoption that, with the arrival of new opportunities, will increase the amount of crypto transactions worldwide and bring growth in revenues to the companies of study.

4. THE MARKET

4.1. Porter's 5 forces analysis of the market

The Porter's 5 forces competitive analysis is an approach widely used to develop strategies in several industries and assess industry attractiveness. What characterizes the attractiveness of a market is the combination of competitive forces. Not necessarily will the weaker the forces make the more attractive the market, but it is the holistic analysis that will give us an overview of how the market behaves and how the industry works. Porter's 5 forces analysis was first introduced by Harvard's MBA and PhD Michael Porter (1979), founding partner of the consulting firm Monitor Group. Porter was a firm believer of differentiation among competitors as a strategy driver.

Rivalry among companies, new competitors, and influence among stakeholders are critical factors that stay throughout time and highly influence the potential revenues of organizations. According to Porter, the competitiveness of an organization would be conformed by the following five forces: bargaining power of suppliers, bargaining power of buyers, threat of new entrants, threat of substitutes, rivalry among existing competitors. In the following pages, I will analyze the current situation of these five powers in the crypto exchange industry.

4.1.1. Bargaining Power of Suppliers

The bargaining power of suppliers affects competition intensity in an industry, particularly when there is a large number of competitors or when there are several substitute options to a supply. In this sense, it is often said that suppliers will be the stronger when they constitute a small number of big corporations highly concentrated; there is no substitute supplies in the industry; or supplies are essential to the core business of downstream companies.

When it comes to the crypto industry, suppliers come in the form of service suppliers. Of the services that these types of exchanges require, the key ones would be two: the crypto miners that validate the transactions, which are far from being concentrated; and the servers that exchanges may use for *cold-walleting*: servers that are used for safe, offline storage of coins. In the case of the first, there exists an estimate of about 1 billion of them. These miners solve a cryptogram that will enable the transaction to be verified. As a compensation for this service, they receive a set fee. With such a little concentration of miners and–despite the 2022 crypto-winter– the growing adoption of cryptocurrencies

among the general public, it looks like they represent little to no bargain to crypto exchange platforms. When it comes to storage providers for cold-walleting, the options get largely reduced, however they do not represent a large barrier to crypto exchanges. Many of them have decided to develop it in-house, reducing costs. Some new players are coming into action as well, as it is the case of Nasdaq. In September 2022, they announced they will be providing crypto-cold-walleting to institutional players – exchanges, banks, investment funds, etc. As of now, the market is not yet atomized, and crypto exchanges seem to handle it well.

Moreover, we have other types of service providers that may represent a cost to crypto exchanges, be it professional services – audit, legal, marketing – however they do not affect their core business. As a consequence of this, I would indicate that there is a **low bargaining power of suppliers in the crypto industry.**

4.1.2. Bargaining Power of Buyers

When clients are concentrated, there is plenty of them or they buy in volume, their bargaining power represents an intense force that affects the competence among the industry. If the bargaining power of buyers is high, rival companies may try to reply via differentiation, by offering different services or special protection to buyers, in order to increase their company loyalty. The bargaining power of buyers will also increase if the products or services offered get standardized or not differentiated. As an example, the bargaining power of commodity buyers is high, however the buyers of luxury goods have little bargaining power, as there normally are very few units of those and tend to be unique pieces.

In the case of crypto exchanges, buyers tend to be of two different types: either individual or institutional clients. Both, in my analysis, have a high bargaining power. The business model of a crypto exchange, in a nutshell, consists of charging fees to users when they make a transaction or for the storage of their assets. The more transactions are made or the more coins an investor holds in the exchange service, the more will the company revenue. As a result to that, it is the buyers – let us say clients in this case – that have a high power. If there were to be less transactions, exchanges would have lesser incomes. For the case of cryptos, the backing currencies of many exchanges, even their value is highly dependent on the number of transactions made or on how much people are interested in buying or selling a certain currency. For this reason, cllients/buyers have a

high power over the exchanges, as the value of these companies themselves highly relies on some of the coins transactioned. Needless to say, the larger the client, the larger the power. For this reason, institutional clients such as banks, hedge funds or others are highly accountable for the exchange's revenues. Many of them do not only use these exchanges to buy and sell, but they also hold a large amount of cryptocurrencies that bring the exchanges large fees. In the case of the smaller ones, it is even simpler: if they were to drain out of the companies' exchange – for whatever reason, maybe a hack – they would not have money to back the exodus. The exact same way it would happen to a bank. Moreover, given the amount of different exchanges that currently exist, clients demonstrate very little attachment to their current one. The cost of change is very little, so they will easily move their assets or start buying and selling via other exchange.

For all these reasons, after analyzing the two types of crypto buyers – institutional and individual – and their implications in the crypto exchange business, we can elaborate that there is a **high bargaining power of buyers.**

4.1.3. Threat of New Entrants

There always exists the possibility of new companies coming into business in a particular industry or sector. This represents a threat to the existing organizations. New entrants increase supply. More supply possibilities push the rest of the companies to improve efficiency and learn how to compete in different product/service dimensions that may have not been explored yet. When evaluating the threat of new competitors, we ought to: 1.) Identify the new organizations that may come into market; 2.) benchmark the strategies of rival companies – both existing and coming; 3.) take actions to discourage other players from jumping into the industry. All these three actions are of high relevance. First, by knowing which players may come into action – meaning, they have the more ease or sinergies to take a piece in the arket – companies can be prepared for what is to come. Second, even in changing contexts, strategies are easily replicable by alike players. For this reason, a good benchmark is key to stay up to date on rival's actions and implement a defensive strategy if necessary. Last, discouraging potential new entrants by what is often called *entry barriers* can be a great catalyzer of market strength.

When analyzing threat of new entrants in the crypto exchange industry, there are many factors to be taken into account. First, which type of companies have synergies with the crypto industry and may at some point jump into it as well? Considering crypto exchanges

as *Fintech*, the answer is clear: financial institutions, or technology companies. Some banks are already implementing their in-house crypto exchange services. These tend to be more of a marketing move than a pivot in their strategy. They are mostly interested on creating app/web engagement among their users than in the actual service they provide. However, the exchange fees are a relevant source of income as well. At some point, though, they might be able to take over the industry by gaining more experience and developing a better service able to compete with crypto exchanges. It is not banks' core business as of now, but we never know what the future may look like. When it comes to technology companies, also, it is not at their core, but it is a growing practice. Meta developing their own cryptocurrency may make other key players follow. Finally, small, new players are always able to come into market, which connects us with point 3 from the above argumentation. Is there any protective barrier towards new players? The entry barriers are relatively small, as it does not take much effort – compared to other industries – to develop a exchange platform. However, the service will be far from that of the current ones and the potential revenues will not be as high as competing on fees with top, established players is complicated. Also, there is not only the main exchanges but at the bottom of the pyramid we find a rather atomized market. Despite that, differentiation is not key for the service so there might be still room for some smaller players to mature and take over. The more the market develops, the harder it will get, but it it is far from being a mature market. When it comes to market development, legislation is a double-edged sword: as the industry gests more and more regulated – requirement of licenses to operate, financial regulation compliance, etc. – there is lesser threat of new entrants. On the other hand, it is a bargain to the companies themselves. Dinner is served here and only time will tell if crypto fintechs become regulated entities equivalent to credit institutions or they continue operating by their own.

Having seen the different possibilities of new entrants – both stablished financial and technological companies, and new crypto-natives – and the current entry barriers hey may face, I can indicate that there is a **high threat of new entrants** in the crypto exchange market.

4.1.4. Threat of Substitutes

Substitute products are different goods or services that come from outside the sector and bring the same functions and similar characteristics of a product inside the industry.

Presence of substitute products is a threat that brings in the risk of customers changing towards such new product, intensifying rivalry among competitors. In the case of crypto, it is hard to come along with substitute products, due to the specificity of the service. However, we may think of some pivotal products from other non-cryto-native service providers that might fit in this description. As an example, PayPal offers to its clients in the UK and the US the possibility to buy, sell, and hold cryptocurrencies. Same case for the neo-bank Revolut. Although these have more of a new player coming in the industry than a substitute product itself, they are differentiated in the sense that an already developed service provider offers a similar service. Quality, variety of coins, and price of the service are the key differentiators here, however the customer base of such fintechs is way larger than those of crypto-natives.

In essence, substitute products are nearly impossible to develop, given the peculiar nature of cryptocurrencies and how they work. In terms of investment possibilities, they are just another option, however it is not only their return on investment that attracts users and institutions alike to invest on them, but their uses and potential applications as well. Having said that, there is not much of a new product or service per se that might be able to take over crypto exchanges. As a consequence, we can imply that there is **low threat of substitutes**.

4.1.5. Rivalry among existing competitors

Rivalry among competitors is, as indicated by Michael Porter, a combination and a consequence of the other four, and the most powerful of all the five competitive forces. Strategy in an organization – M. Porter says – can only be successful in the way it brings a competitive advantage over the strategies of rival companies. The intensity of rivalry among competitor companies tends to increase as some factors grow. Some examples are the following: large number of competitive companies similar in size/capacity; slow growth of the industry; decrease in demand of the product or service; high fixed costs; large increases in capacity of competitors; fall of prices of the product or service in the industry; fall of prices; quality improvements; offering of complementary services. The more rivalry intensifies among competing companies, the added-value of the industry decreases so much that it may even lose its whole attractive.

In the case of the crypto exchange industry, we can consider that rivalry among competitors has been developed in a good essence, as the more players there is and the more credentials they make, the more the whole industry will benefit. This point will be further developed in the coming paragraph, as I believe there is much to be written about how they are creating a **Blue Ocean competition**. However, to illustrate the fifth force, considering a highly-atomized market where some players are growing a lot, but there is still room for growth, I will indicate that there is a **middle-high rivalry among competitors** in the crypto exchange industry.

4.2. The Blue Ocean strategy in the crypto industry

The Blue Ocean strategy was first introduced by INSEAD's professors W. Cham Kim and Renée Mauborgne (2005). After a thorough study of the strategic moves of 150 companies from 30 different industries across the last 100 years, they determined that companies able to develop success sustainably tend to focus in developing new market spaces (blue oceans), instead of competing in those that are already consolidated (red oceans). In this sense, we can define the Blue Ocean strategy as a change in mentality when creating new business opportunities. It consists of finding new niche markets that have not yet been operated instead of competing in those full of competitors. These niche markets are called Blue Oceans. We refer as Red Ocean to those markets where the different markets compete fiercely for clients, as if they were "blood-bathed". In these type of strategies, it is much harder to grow as they have to take clients from competitors. It is also very hard to make margins remain high as normally, instead of via differentiation, companies try to excel via price strategy. Generally speaking, it is hard to compete in red oceans and create value, as every company takes similar strategies. They focus on the same customer bases with similar value propositions. The Blue Ocean strategy, however, shows a very different perspective. Forgetting about competitors and looking for an undeveloped market or customer base, able to grow and with much larger margins. Blue oceans make competition almost irrelevant, as the companies in the market set the rules. According to generic competitive strategies, M. Porter (1980), there is only two sources of competitive advantage: differentiation or cost leadership. Instead, the Blue Ocean strategy integrates a different approach. It indicates that, in certain markets, companies are able to create value at a small cost. The Blue Ocean strategy is based on

the idea that there is no need for a tradeoff between cost and value. That means, value can be given to clients at a fair price.

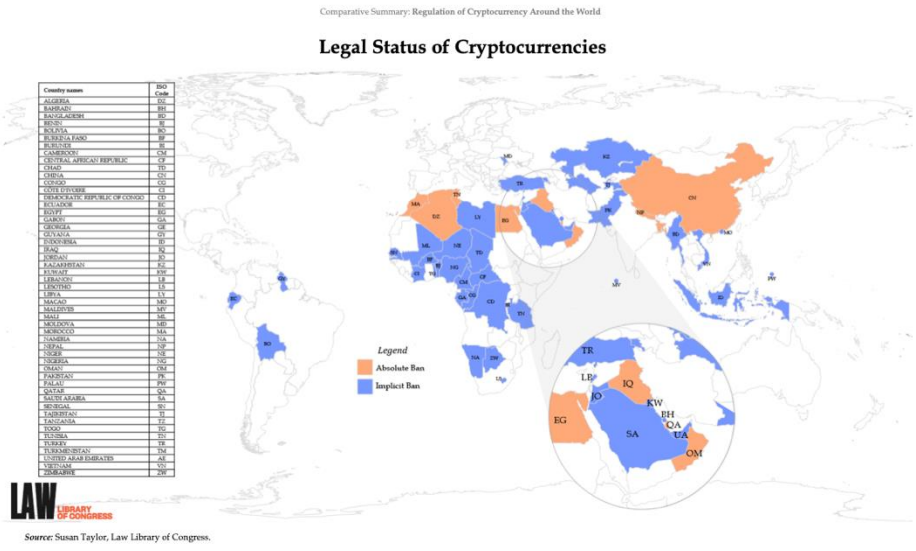
When it comes to crypto exchanges, at least in the short and midterm, we see a rather clear blue ocean. First, we are talking about a very niche market: a bare percentage of the population buy, sell, or hold cryptos. Also, it is still to be more and more developed. Second, when it comes to value offering, they highly depend on one main condition: crypto adoption. The more people believe in cryptocurrencies' power, either as a payment means, as a speculative tool, or as a value reserve, the more clients they will have. In this sense, they **leverage competition** by bringing new clients into the market. Clients that, without the marketing, lobbying, or educational efforts of the whole industry, might not be interested. For this reason, they are making competition irrelevant or even beneficial. This connects as well to a third point: they focus on non-customers. That is, they try to grow the market instead of fighting among competitors for their piece of the cake. This is a key indicator of a Blue Ocean. Last, but not least, they offer a clear value to the customer without fighting in cost leadership.

For all the above mentioned reasons, we can see how the crypto exchange industry is a clear Blue Ocean: it is yet to be developed, have a large potential growth, companies are able to leverage competition as they bring more potential customers into the funnel, and they offer value without the need of lowering prices.

Exhibit 1

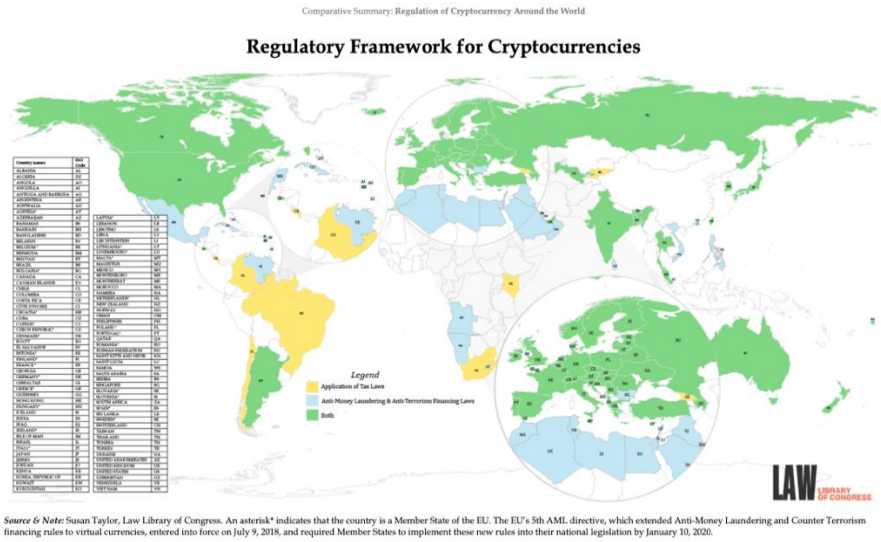
Source: motorsport.com

Exhibit 2



Source: The Library of Law

Exhibit 3



Source & Note: Susan Taylor, Law Library of Congress. An asterisk* indicates that the country is a Member State of the EU. The EU's 5th AML directive, which extended Anti-Money Laundering and Counter Terrorism financing rules to virtual currencies, entered into force on July 9, 2018, and required Member States to implement these new rules into their national legislation by January 10, 2020.

Source: The Library of Law

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