# The impact of Fintech innovations on the Derivatives Market

## A case study of Binance

**Asmaa CHERKI**∗ , University of Mustapha Stambouli Mascara (Algeria)

asmaa.cherki@univ-mascara.dz

**Sadek SEFFIH**, University of Mustapha Stambouli Mascara (Algeria)

s.seffih@univ-mascara.dz

## Abstract:

This research paper aims to study the impact of Fintech innovations on the financial derivatives market, through their various technologies such as blockchain, big data, Artificial intelligence…etc. The study is supported by the review of futures trading statistics on the Binance platform and comparing them with trading statistics on traditional markets.

Fintech has revolutionized derivatives markets by improving accessibility, efficiency and transparency, while also bringing challenges such as cybersecurity and regulatory gaps.

This dynamic interplay requires collaborative efforts from stakeholders by prioritizing adaptable regulations, fostering collaboration with experts to understand fintech innovations, robust security measures and informed decision-making. By doing so, they can harness the benefits of fintech while mitigating risk and fostering responsible innovation in derivatives trading.

## Keywords:

Fintech innovations, financial derivatives, Binance, Futures.

---

∗ Corresponding author: **Asmaa CHERKI**

## 1. INTRODUCTION:

After 2008 Financial crisis, customers lost trust in financial institutions. The derivatives market impacted with the emerging of the financial crisis, as securitization banks purchased mortgages, bundled them into mortgage-backed securities ("MBS") and sold these derivatives to investors. Thus, securitization-based derivatives allowed banks and mortgage firms to increase the velocity and turnover of loans and the transfer of risk to other investors. (Haiss & Sammer, 2010, p. 27)

Innovators have had to choose between relying on a system based on trust in financial institutions or considering alternatives where neither trust nor banks are required as intermediaries for the successful and secure execution of financial transactions. (Paolini, 2020, p. 01)

Over the same period, Fintech has emerged as a term to describe technological breakthroughs that can transform financial services, create new business models, applications, processes and products as well as improve security and privacy. (Murinde & al, 2022, p. 01)

### 1.1. Statement of the problem:

The use of information technology in the financial sector through the last decades facilitated the financial transactions but was unable to reduce the financial intermediation costs. This is what fintech is currently doing as its main target is to reduce financial transaction costs while protecting customer data. It is not altogether clear whether Fintech innovations will disrupt the derivatives market or strengthen it. This is what we aim to highlight in this piece of research.

### 1.2. Research Question:

This piece of research aims to answer the following key problem: **How the fintech innovations impact the derivatives market and their trading?**

### 1.3. Hypothesis :

This study based on the assumption that, thanks to the emergence of Fintech innovations, traders can easily trade financial derivatives, as they have led to lower costs and less regulation.

### 1.4. Significance of the Study:

Due to the major technological impact on the financial field in recent years, the research paper considers it necessary to study the impact of these technologies on the financial derivatives market, as the most controversial financial instruments.

### 1.5. Objective of the Study :

Due to the major impact of new technologies on the financial field in recent years and the conflicting views on whether this is a positive or a negative effect. This research paper considers it necessary to study the nature of the impact of these technologies on the financial derivatives market, as these are the most controversial financial instruments.

### 1.6. Methodology of the Study :

This paper used the descriptive approach to understand the theoretical aspects of each of the fintech and its innovations and the financial derivatives, then the analytical approach to analyze the graphical figures.

### 1.7. Literature review :

Research focusing on the impact of Fintech on financial derivatives is still very limited. In existing literature, authors have investigated the contributions of the Fintech adoption and the derivatives trading but in separate articles or under separate frameworks of study.

According to **Victor Murindev et** al, The key difference between "traditional" investments in financial technologies and "new" ways of introducing technology in finance is that older technology implementations mainly focused on creating more cost-effective operations and achieving efficiencies through automation, while the "new" FinTech is geared more towards rethinking entire business processes and introducing new business models in finance, In this new financial services landscape**,** banks have basically three alternatives: do nothing, implement FinTech technologies or cooperate with FinTech companies, perceive them as competitors and attempt to prevent their entry in the market or refuse to accommodate them. (Murinde & al, 2022) According to **Jurijs Baltgailis and Anastasiia Simakhova** the growth of FinTech operations is associated primarily with the development of operations with derivatives on exchanges and other platforms, They also mentioned that the FinTech system is rather an intermediary between banks and their clients, working in the interests of banks, using their assets and client money to minimize risks in transactions with derivatives and securitization. (Baltgailis & Simakhova, 2022) **Varma** pointed out that Blockchain lowers the need for trust in central hubs as well as provides an excellent foundation for smart contracts by reducing transaction costs. (Varma, 2019) According to **O. Y. Kuzmina et al** by using financial derivatives, the investor forms his own hedging strategy that enables him to predict changes in the economic situation, through digital technologies, such as robots and electronic advisers.Kuzmina et al analyse the dynamics of the derivatives market in the Russian Federation over the past ten years, They concluded that increasing market transparency through the use of digital technologies can ensure sustainable development of the Russian derivatives market in the future. (Kuzmina & al, 2021)

## 1.8. Organization of the Study :

The paper organized as follows: after the introduction it is a conceptual review to the financial derivatives market. next, the Fintech innovations, then a case study of Binance, to the study's conclusion and findings, along with a few recommendations .

## 2. The derivatives market :

The derivatives market is not a single, physical place, it consists of all over the counter and on-exchange financial instruments that derive their worth from an underlying asset.

The derivatives market plays an important role in the global financial system. Well-known exchanges listing derivatives include: (IG, n.d.)

▪ The Chicago Mercantile Exchange (CME), which is one of the world's oldest exchanges and trades derivatives like futures and options, linked to commodities and sectors, most famously the agricultural sector and soft commodities.

▪ The Intercontinental Exchange (ICE), which trades derivatives linked to foreign exchange, commodities and more.

▪ The ICE Futures Europe exchange, formerly known as the London International Financial Futures and Options Exchange (LIFFE), which is one of the foremost exchanges in the UK and trades options and futures, most notably on Brent Crude oil.

## 2.1 Financial derivatives:

Financial derivatives are a key part of the infrastructure of any financial sector. They provide effective hedging tools and enhance economic development, yet they are complicated and highly regulated.

Financial derivatives can be defined as derivative contracts specifying financial instruments, interest rates, foreign exchange rates or financial indexes as the underlying. (Kolb & Overdahl, 2002, p. 01) They are used for portfolio adjustments, hedge, arbitrage. When used properly, derivatives give end users the ability to more effectively manage the risks associated with holding increasingly larger portfolios of diverse financial assets. (Rusinko & Matthews, 1998, pp. 17-23)

There are four types of derivatives (futures, forwards, options and swaps) outlined below:

Futures: a future contract is an agreement to buy or sell a particular asset between two parties in a specified future period, at an agreed price through specified exchange. (Gupta, 2017, p. 36) , Futures contracts play an important role in the derivatives market, which is the largest and most complex segment of the financial system. Futures contracts can be used to hedge against price volatility in the underlying security or commodity. (INDmoney, 2022)

▪ Options: An option contract grants its owner the right, but not the obligation, to take some action. There are two option types: a call and a put. A call gives its owner (the long) the right, but not the obligation, to purchase a specified quantity of the security (named the underlying security) at a specific price (termed the exercise price or the strike price) on or before a given date, at which time the call expires. A put grants its owner the right, but not the obligation, to sell a specified quantity of the underlying security at the exercise price (strike price) on or before a given date (expiration day). (Arditti, 1996, pp. 03,07)

▪ Forwards: Forward contract is a simple form of financial derivative instruments. It is an agreement to buy or sell a specified quantity of an asset at a certain future date for a certain price agreed upon now. In a forward contract, two parties agree to do a trade at some future date at a stated price and quantity. No money changes at the time the deal is signed. (Gupta, 2017)

▪ Swaps: A swap is an exchange between two parties, a cross-credit outflow agreed for a period fixed at the outset, from a few days to a few months or years. This exchange enables the counterparties to exchange a series of future cash flows.  Swaps are therefore financial derivatives, whose value depends on that of the "underlying".  They are used for hedging or speculative purposes, on the currency market for example. Underlying's are highly varied: interest rates, currencies, inflation, etc. (Boluze, 2019)

Since our study focuses on financial derivatives, it is useful to state the number of futures and options contracts traded globally 2013-2021, as shown below:

**Figure 01:** Number of futures and options contracts traded globally 2013-2021.
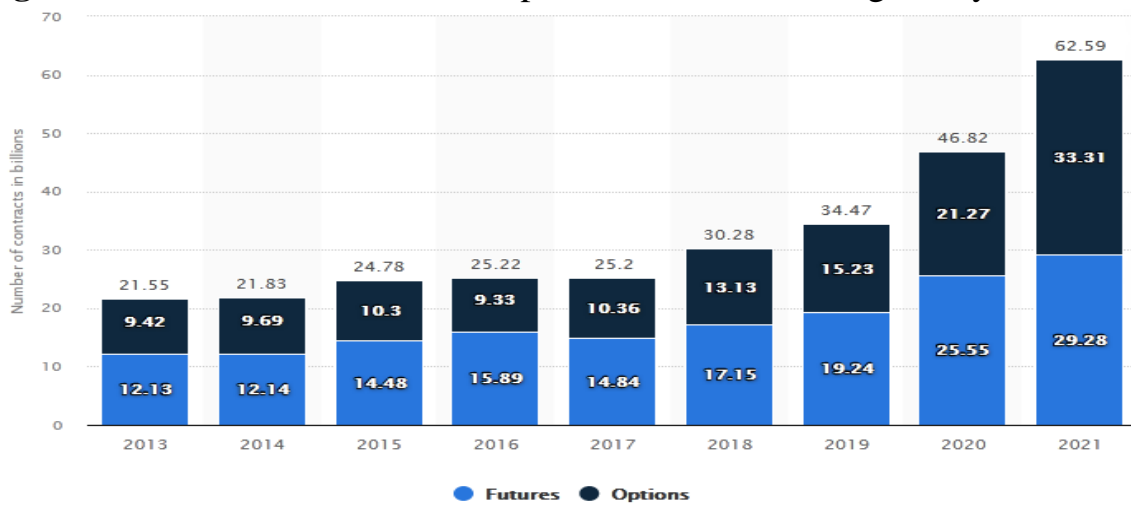


**Source:** Statista, 2022, read: 11/12/2022.

In 2021, 29.28 billion futures contracts were traded worldwide, up from 12.13 billion in 2013. The number of options contracts traded increased from 9.42 to 33.31 billion contracts in the same period. Both contracts are financial derivatives, used to manage financial risk and speculate on future market performance. (Statista research department, 2022)

The FIA derivatives exchanges findings for 2022 show that numbers are up for futures and options. On an annual basis, volume in 2022 was 83.85 billion contracts, up 34% from 2021, with the majority of that increase coming from equity index contracts.

Total options volume for the year was 54.53 billion contracts, up 63.7% from the previous year, while the total futures volume was 29.32 billion contracts in 2022, up 0.1% from 2021. (McAughtry, 2023)

## 2.2. Derivatives trading in traditional finance:

The financial derivative contracts are traditionally issued by centralized institutions and banks and are sold to individual market participants, be it traders or other institutions. When derivative contracts are sold between two large companies or institutions, this gets termed as institutional derivatives trade, commonly referred to as OTC or "Over the Counter". When these derivative contracts are sold to individual market traders these are termed as retail derivatives trade, commonly referred to as OTE or "Over the Exchange" (Kadikar, 2021) .Derivatives that trade on an exchange are standardized contracts. There is counter-party risk when trading over the counter because contracts are unregulated, while exchange derivatives are not subject to this risk due to clearing houses acting as intermediaries. (Zucchi, 2022)

Derivatives trading hedge the traders position in the market, which means opening a second position that will become profitable if another of his positions starts to make a loss. In this way, you can mitigate the risk by gaining some profit and limit the losses overall, without having to close the initial position. Entities speculate on the future price direction of the underlying asset and hope to profit from the difference between the strike price and the exercise price (5paisa Research Team, 2023). Also, derivatives can be used to increase leverage this enables to take a position for a fraction of the cost of the position's total value (for example, using $10 to open a position worth $300). However, this magnifies the size of both the potential profits and the losses that can be made. (IG, n.d.)

## 3. Fintech innovations:

The Fintech revolution is in full swing worldwide. The interplay of financial services and technology is as old as the E-payment services. However , The "new" FinTech innovations that enable the deployment of these financial services , are geared more towards rethinking entire business processes and introducing new business models in finance (Murinde & al, 2022, p. 12).

The Financial Stability Board (FSB) defines Fintech as "technologically enabled financial innovation that could result in new business models, applications, processes, or products with an associated material effect on financial markets and institutions, and the provision of financial services." (Financial Stability Board, 2022)

Based on the preceding, Fintech can be defined as a set of new technologies aiming to develop the financial sector. Fintech provides innovation solutions to facilitate the integration of financial services offered by financial institutions.

### 3.1 Fintech technologies :

### 3.1.1. Artificial intelligence (AI), Machine learning and deep learning:

**3.1.1.1. Artificial intelligence**: the creation of systems performing tasks that usually require human intelligence. It can be loosely interpreted as incorporation of human intelligence into machines. In AI, machines complete the task based on the stipulated rules and algorithms. (Jakhar & Kaur, 2019, p. 01)

**3.1.1.2. Machine learning**: Machine learning is the subfield of artificial intelligence in which algorithms are trained to perform tasks by learning patterns from data rather than by explicit programming. (Chartrand & al, 2017, p. 2114)

**3.1.1.3. Deep learning: Deep** learning (DL) is a technique belonging to (ML), which in turn refers to a broader (AI) family (Fig.02) (Chassagnon, & al, 2019, p. 02). It incorporates computational models and algorithms that imitate the architecture of the biological neural networks in brain [artificial neural networks (ANNs)]. (Jakhar & Kaur, 2019, p. 01)

**Figure 02**: Deep learning is a subset of machine learning.
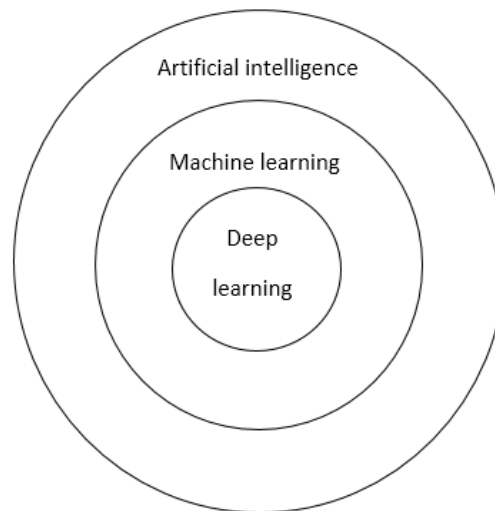


**Resource**: Jakhar, D., & Kaur, I, 2019, p01.

**3.1.2. Big Data**: Big Data represents the Information assets characterized by such a High Volume, Velocity and Variety to require specific Technology and Analytical Methods for its transformation into Value. (De Mauro & al, 2015, p. 103)

**3.1.3. Blockchain**: Blockchain is a distributed ledger that facilitates the validation of transactions through Bitcoin. A blockchain is a cryptographically connected collection of transactions that include data that often use distributed and scalable peer-to-peer network infrastructure, rather than centralized management; it is a system without any intermediaries. (Bala & al, 2021, p. 92)

**Figure 03** : Blockchain transaction flow.
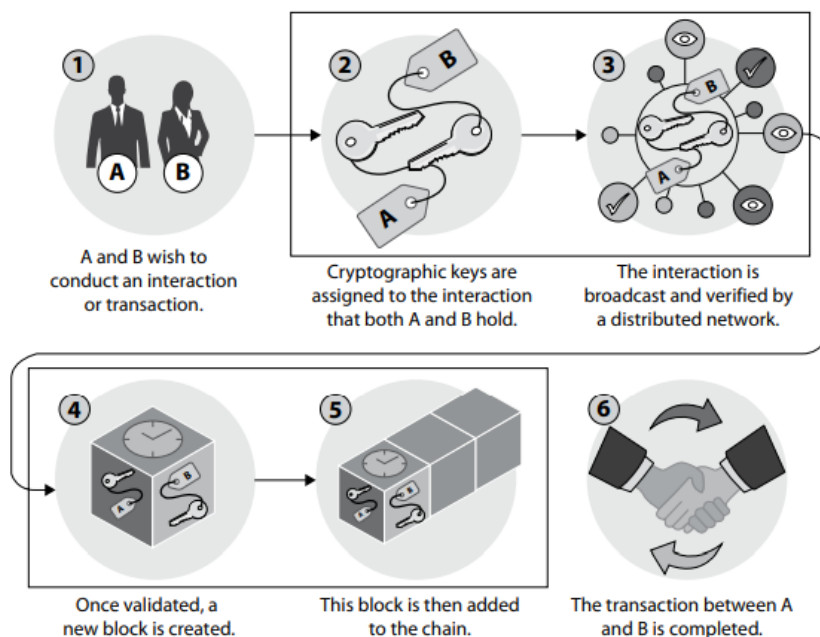


**Resource**: Joseph J. Bambara, Paul R. Allen, 2018, p02.

The figure shows that Blockchain is a database encompassing a physical chain of fixed-length blocks that include 1 to N transactions, where each transaction added to a new block is validated and then inserted into the block. When the block is completed, it is added to the end of the existing chain of blocks. (Bambara & Allen, 2018, p. 01)

**3.1.4. Cloud computing**: The National Institute of Standards and Technology (NIST) Defined Cloud computing as **"**a model for enabling ubiquitous, convenient on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction. This cloud model is composed of five essential characteristics, three service models, and four deployment models**"**. (Rashid & Chaturvedi, 2019, p. 421)

**3.1.5. Internet of things (IOT)**: has been outlined, "Things that have identities and virtual personalities operating in smart spaces using intelligent interfaces to connect and communicate within the social, environmental, and user context".  (Mohammed Salih & al, 2022, p. 02)

**3.2. Cryptocurrency derivatives :**

Cryptocurrency is typically decentralized digital money designed to be used over the internet. Bitcoin, which launched in 2008, was the first cryptocurrency, and it remains

by far the biggest, most influential, and best-known. (Coinbase, n.d.) Cryptourrencies are Blockchain-based technologies.

Cryptocurrency derivatives are derivative contracts with an underlying of a digital asset or group of assets. The crypto derivatives exchange market started in 2019 and peaked in 2021 as the (Figure 04) shows below

**Figure 04**: Crypto derivatives market trading volume 2019-2022.



**Source**: TokenInsight, Dec 08,2022, Binance Feed,
https://www.binance.com/fr/feed/post/109528

According to latest data from CoinDesk, Cryptocurrency derivatives trading volume grew faster than the spot market last years (Figure 05).

Derivatives volume in January was up 76.1% from December to $2.04 trillion, the largest percentage increase since January 2021 when volume rose 114%.

Derivatives trading now represents 70.3% of the entire crypto market, up from 68% in December, according to CryptoCompare data. ( Ledesma,, 2023)

**Figure 05** : Cryptocurrency Derivatives and Spot Market Monthly Volumes.
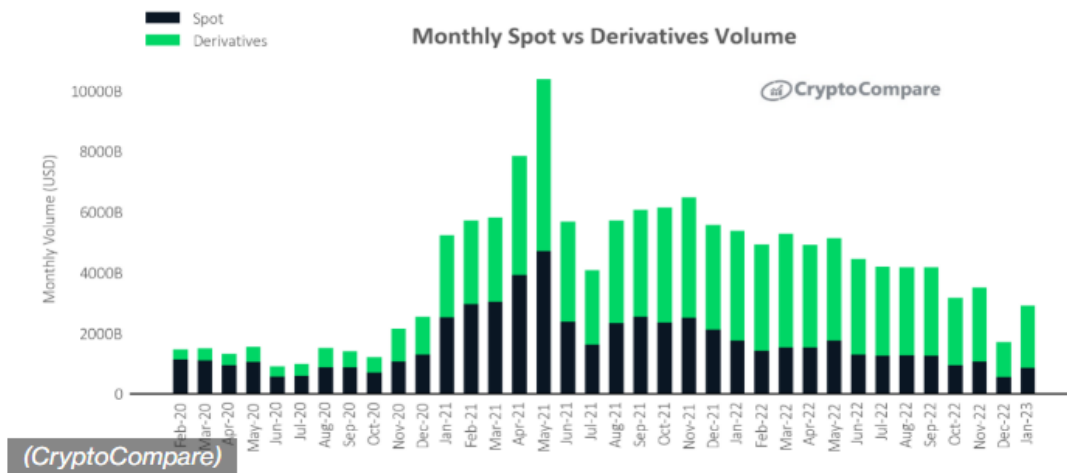


**Source:** Lyllah Ledesma**,** 03 Feb 2023.

With $1.26 trillion in volume, Binance continued as the largest derivatives exchange in January, followed by Bybit which had a 115% increase to $301 billion (the only integrated derivative exchange with triple-digit, month-on-month growth) as shown on the table below. ( Ledesma,, 2023)

**Table 01** : Top 10 Cryptocurrency Derivatives Exchanges.

| rank | Name | Trading volume 24h | Open interests | No. Markets | launched |
|---|---|---|---|---|---|
| **01** | Binance | $47,836,904,739 | $32,972,326,811 | 257 | Jul 2017 |
| **02** | Bybit | $11,129,032,867 | $3,629,476,042 | 202 | Mar 2018 |
| **03** | OKX | $14,064,850,574 | $2,781,193,100 | 184 | Jan 2017 |
| **04** | KuCoin | $2,154,920,292 | $1,537,018,856 | 119 | Aug 2017 |
| **05** | Deribit | $907,139,312 | $1,026,062,831 | 25 | Jun 2016 |
| **06** | Bitget | $7,252,927,841 | $2,960,054,801 | 110 | Apr 2018 |
| **07** | Bitfinex | $154,275,280 | $85,005 | 31 | Oct 2012 |
| **08** | Kraken | $102,665,156 | $44,816,833 | 91 | Jul 2011 |
| **09** | Huobi | $2,212,707,113 | $222,817,499 | 67 | Sep 2013 |
| **10** | BitMex | $595,926,941 | $1,267,281,761 | 22 | Apr 2014 |

**Source** : CoinMarketCap, retrieved from :

https://coinmarketcap.com/rankings/exchanges/derivatives/ , read : 03/03/2023.

### 3. Binance

Launched in july of 2017, Binance is the largest cryptocurrency and crypto derivatives exchange platform globally with more than 350 cryptocurrencies for trade. Over 38 billion daily trading volume and 120 million registered traders in Binance, In the last few years, the platform has been attracting many famous names such as Cristiano Ronaldo and Mark Zuckerberg . (Binance, 2023)

Aside from being the largest cryptocurrency exchange globally, Binance has launched a whole ecosystem of functionalities for its users. The Binance network includes the Binance Chain, Binance Smart Chain, Binance Academy, Trust Wallet and Research projects, which all employ the powers of blockchain technology to bring new-age finance to the world (CoinMarketCap, 2023). It also supports a variety of fiat currencies including (USD, EUR, AUD, GBP, HKD, and INR ), While its low fees might be appealing, the platform has run into regulatory issues and is currently under investigation in the U.S. (Clinbelle, 2023)

It offers the lowest trading fees among other companies.

Binance supports a wide selection of popular cryptocurrencies including : (Binance, 2023)

- Binance Coin (BNB).
- Bitcoin (BTC).
- Ethereum (ETH).
- Galxe (GAL).
- Green Metaverse Token (GMT).

To date, Binance is available in 140+ countries over the world (Figure 06), but still not all countries have access to all features on Binance. (Help with Penny, 2023)

**Figure 06**: Binance supported countries worldwide in 2023.
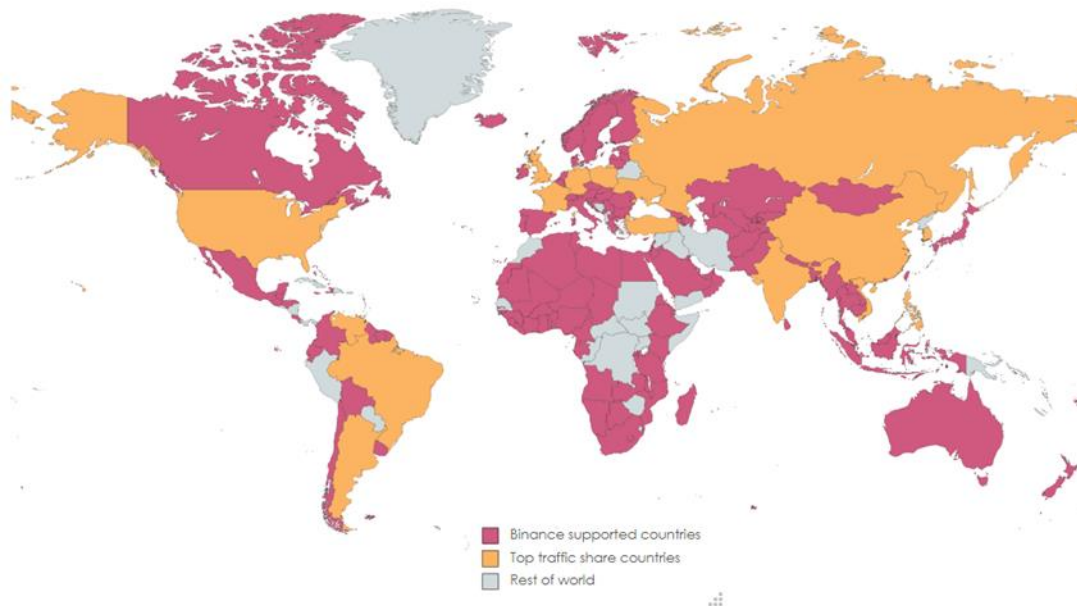


**Source**: Created by the authors based on data from **Help with Penny** and **SimilarWeb.**

**Security**:

Binance have built a robust KYC system that is thorough, compliant in over 200 jurisdictions, and supported by industry-leading KYC companies such as Onfido, Jumio, and Trulioo, among others.

As of July 2022, Binances KYC process is split into three tiers — Verified, Verified Plus, and a custom limit available upon request — and requirements will vary depending on the local regulations. (Binance, 2022)

**Types of crypto derivatives in Binance**

Binance offers futures trading through two flagship products: Perpetual Futures the contracts that do not have an expiration date. Therefore, traders do not need to keep track of various delivery months, this type of futures carry funding fees since they are unstable, in the other hand quarterly futures contracts that allow traders to buy or sell the underlying asset at a predetermined price before a specified period and they do not carry funding fees. (Binance, 2021)

Binance offers options priced and settled in stablecoin, which makes cost and profit calculations straightforward for investors, It provides one of the lowest fees in the market (0.02% transaction fees and 0.015% exercise fees). (Binance, 2022)

## How to trade on Binance?

Crypto derivatives enable traders to gain exposure to a wide range of digital assets without owning them. Binance Futures is the world's leading crypto derivatives exchange, offering traders a convenient way to speculate on the price action of digital assets, therefore we've taken them as an example to introduce the trading method on this platform: (Binance, 2022)

**Step 1**: Sign up for a Binance account with phone or email to create a personal or entity account (Refer to annexe N° 01)

**Step 2**: Open a Binance futures account: go to Binance Futures and click **[Open Account]**, pass a quiz to activate your Binance Futures account by clicking **[Take Quiz]** and answer all the questions correctly.

**Step 3**: Verify your account: to unlock all the features that Binance offers, you must verify your identity by going to Binance, then clicking **[Profile]** - **[Identification]** and complete the process.

**Step 4**: Make the first deposit: Before making the first trade on Binance Futures, you must deposit fiat or cryptocurrencies by going to Binance and clicking **[Buy Crypto]** at the top left corner of the page, Then Select the **[Currency]** and the method to use to make the first deposit, To deposit cryptocurrencies, go to Binance and click **[Wallet] - [Fiat and Spot]** at the top right corner of the page. Click **[Deposit]** at the top of the page then Select the **[Coin]** you'd like to deposit into your Binance account.

Once the trader has sent his funds to his Binance wallet, He can check the deposit status on a blockchain explorer using the transaction ID information. The trader must transfer funds to the Binance Futures wallet to make his first crypto derivatives trade by going to Binance and clicking **[Wallet]** - **[Futures],** Click **[Transfer],** select the **[Coin],** enter the **[Amount],** and click **[Confirm].**

**Step 5:** Make the first trade: To make the first trade on Binance Futures, go to Binance Futures and choose between **[USDⓈ-M]** and **[COIN-M]** Futures Contracts. Select the **[Futures Contract]** to trade at the top left side of the page (Refer to annexe N° 02).

Use the **[Price Chart]** to identify potential trading setups based on patterns or any technical indicator available on Binance Futures (Refer to annexe N° 03).

Select the **[Margin Mode]**, which will only apply to the selected Futures Contract, then choose between **[Cross]** and **[Isolated]** and click **[Confirm]** (Refer to annexe N° 04).

Adjust the leverage by clicking **[Adjust Leverage]** and click **[Confirm]**.

Note: using high leverage carries high risks and should not be done without a robust risk management strategy (Refer to annexe N° 05).

Select **[Type of Order] - [Price] - [Size]**, toggle the **[TP/SL]** feature to set up your **[Take Profit]** and **[Stop Loss]** orders, and choose between a **[Buy/Long]** or **[Sell/Short]** position (Refer to annexe N° 06).

**Futures trading Data on Binance:**

This paper used Binance's Historical Market Data page. to collect futures trading volumes data, We used monthly aggtrades futures data from July 2021 to April 2023 of Bitcoin, Ethereum, Binance coin as the market's most popular and most traded crypto-currencies to date. These futures are BUSD margined contracts that represent only one unit of their respective base asset, similar to spot markets and can help reduce the risk of large price swings. (Binance, 2021)

We calculated the total monthly trade volumes for each cryptocurrency separately, based on number of contracts and prices, and then transformed the findings into graphics using Excel.

**Data analysis :**

- Bitcoin futures are the most highly traded crypto derivatives on Binance in terms of price and trading volume, due to Bitcoin's global standing.

In September 2021, 6.11 billion BTCBUSD futures contracts were traded on Binance, up from 3.51 billion in August, then it rose in November to 6.66 B as the price of Bitcoin soared and reached around 68000$ in the market. Trading volume kept swinging between 5.4 B in December and 5.08 B in May 2022 due to Bitcoin's price fluctuation as the price decreased from 57,000 $ at the start of December to 46,000 $ at the close of the month, and it kept decreasing, reaching 28,000 $ in May 2022 based on Historical data from "Investing.com" (Investing.com, 2023), The trading volume saw a peak increase in June 2022 reaching 7.85 B (Figure 07), In this month the value of the underlying asset (Bitcoin) dropped compared to May, with prices between 18,000 and 31,000, we spotted through the data that the buy contracts were more than the sell contracts with a slight difference (in the column"is buyer maker" if it's true the order maker is buying and if it's false he is selling) we calculated 524798 False (sell contracts) and 523777 True (buy contracts) this is probably due to the predictions of a further fall in the Bitcoin's price in the next days.

Binance has seen the largest bitcoin withdrawals in its history, according to data published on December 13, 2022 by blockchain data firm Nansen, which confirmed that the platform has recorded $ 1.9 billion in withdrawals over the past 24 hours. (Wilson & Howcroft, 2022) It is notable that the futures trading volume increased in December and remained strong in the months ahead, meaning that the futures market was not affected by this downturn (Figure 07).

**Figure 07** : BTCBUSD futures aggtrade volume from (July 2021-April 2023)
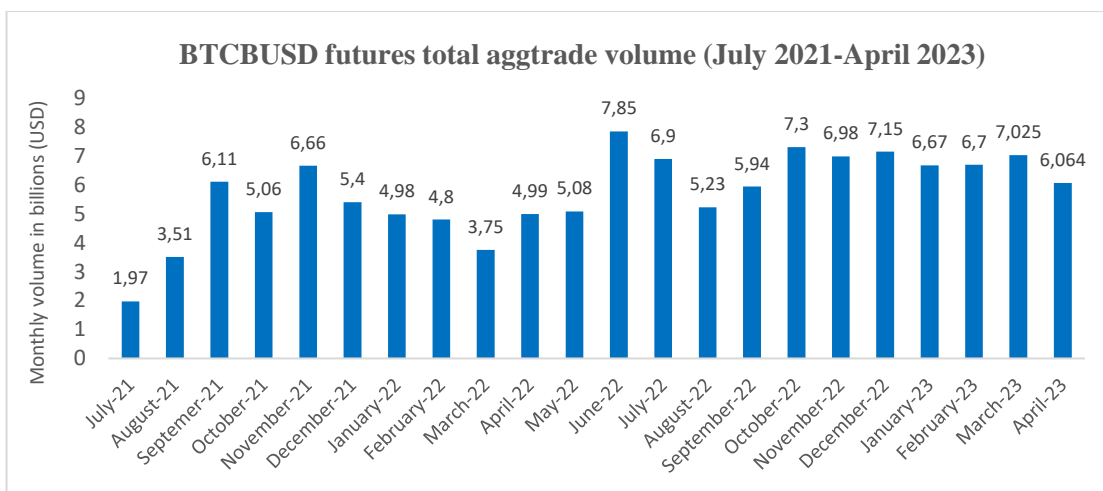


**Source** : Calculated by the authors based on Data from Binance.

• Ethereum is the second most traded cryptocurrency after Bitcoin in the market and Binance. According to the data we gathered from Binance's website, we obtain the following results (Figure 08).

The ETHBUSD futures trading volume on Binance was 1.34 B in august 2021 up from 0.73 B in July, According to Historical data from "Investing.com" the price of Ethereum rose by the end of October reaching about 5000 $ (Investing.com, 2023) thus the trade volume jumped to 3,63 B in the next month. From December to July 2022 the trade volume varied between 2 and 3.6 B whilst the Ethereum's price kept dropping from 3,000$ in December to 1,000 $ late June then rose by the end of July to 1700$. In July, we estimated 529627 sell contracts versus 518948 buy contracts, caused by the underlying asset's price rising again from 1,000$ to 1,700$ by the end of the month. It's worth noting that Ethereum prices change continuously and fast up and down from the beginning to the end of every month. The trading volume peaked in January 2023 to 6,62 B as Ethereum's price gradually rose from 1,200$ to 1,700$ this month after hitting 1,300 in December, this explains the exceed in number of sell contracts (533004 contract) compared to buy contracts (515571 contract).

**Figure 08** : ETHBUSD futures aggtrade volume from (July 2021-April 2023)
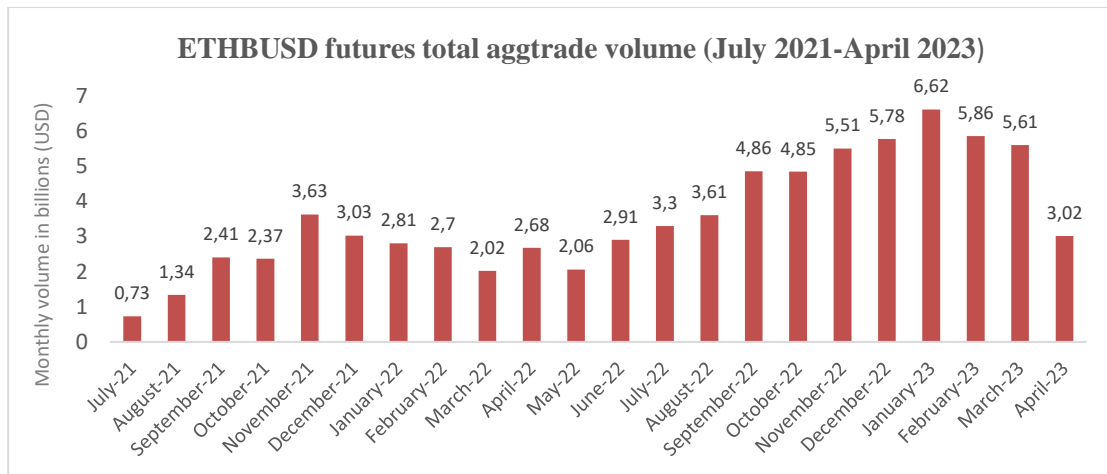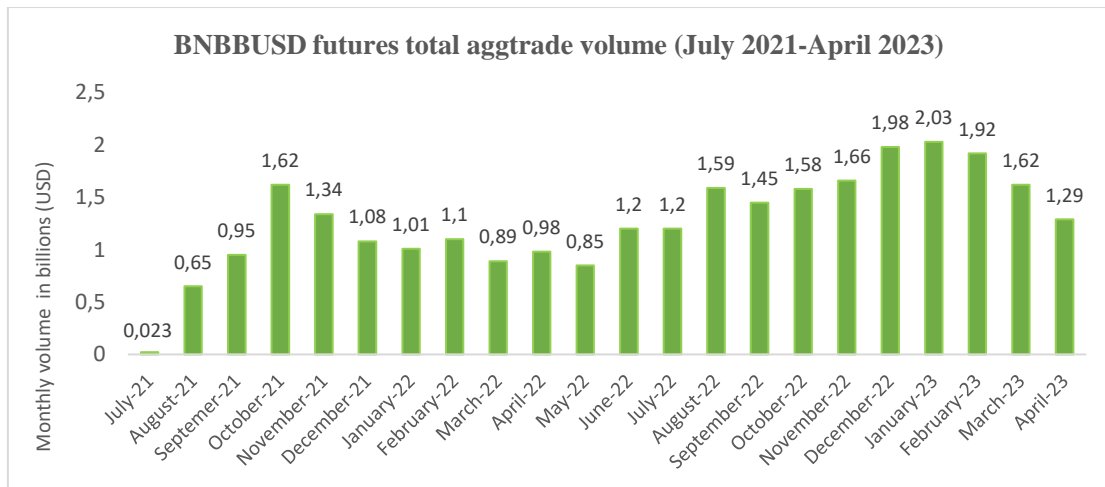


**Source** : Calculated by the authors based on Data from Binance.

• Binance Coin is the cryptocurrency issued by Binance with the BNB symbol, and it is the third most traded cryptocurrency after Bitcoin and ethereum in Binance.

Binance coin was launched in 2017 and was initially based on the Ethereum network but is now the native currency of Binance's own blockchain, the Binance chain. Binance allows traders to convert their dust into BNB ;In the world of cryptocurrency, dust refers to any amount of coins or tokens that are so small they're often ignored. They're basically the tiny fractions left from trades. (Frankenfield, 2023)

The BNBBUSD futures trading volume in Binance was 0.023 B in July 2021 then it went up reaching 1.62 B in October 2021 (Figure 09)  while the price went up on the market from  around 422$ at the beginning of the month to 524$ at the close (Investing.com, 2023). The trading volume dropped in the next months hitting 0.85 B in May 2022 as the underlying asset's price went down from 389$ to 320$ in this month, The number of sell contracts amounted to 503729 while the number of buy contracts was 544847 this is normal given the low price. In July 2022 the price of BNB increased from around 216$ in the beginning of the month to 287$ at the end so the sell contracts amounted to 541594 compared to 506981 for the buy contracts with 1.2 B trading volume. In January the trade volume rose to 1.98 B with 525411 sell contracts and 523164 buy contracts as the price of BNB jumped from 244$ to 307$ at the end of  this month, in the next month the trading volume reached its peak hitting 2.03 B while the price dropped to 301 by the end of February, the trading volume kept swinging hitting 337 at the close of April while the trading volume was 1.29 B with 525779 sell contracts compared to 522796 buy contracts

**Figure 09** : BNBBUSD futures aggtrade volume from (July 2021-April 2023)



**Source**: Calculated by the authors based on Data from Binance.

• Exchange-traded derivatives (ETD) are standardized financial contracts, traded on an exchange that settle through a clearinghouse, and is guaranteed such as the "Chicago Mercantile Exchange" (CME), "International Securities Exchange" (ISE), the "Intercontinental Exchange" (ICE), or the "LIFFE exchange" in London. ETDs differ from Over the counter (OTC) derivatives in terms of their standardized nature. (Tun, 2022) The following figure shows the trading volume of exchange traded futures contracts in such a timeframe.

**Figure 10**: ETD futures trade volume from (July 2021-April 2023)
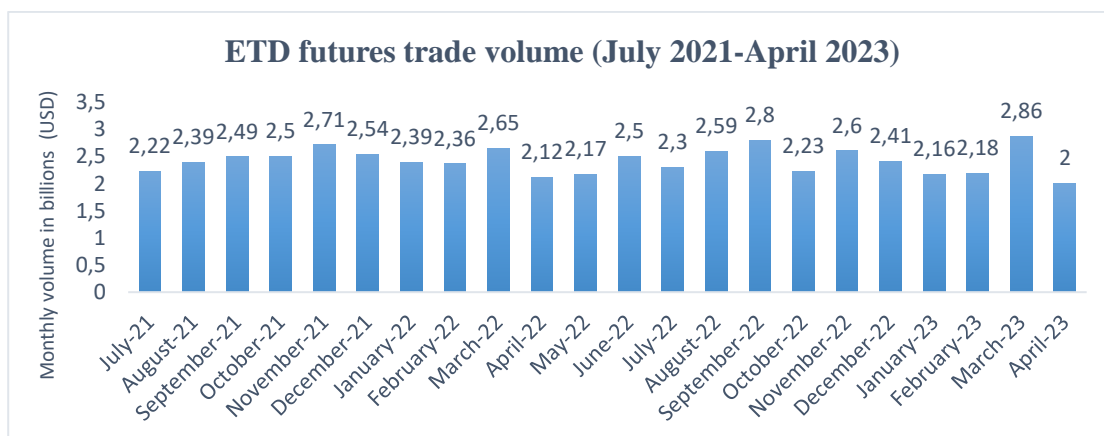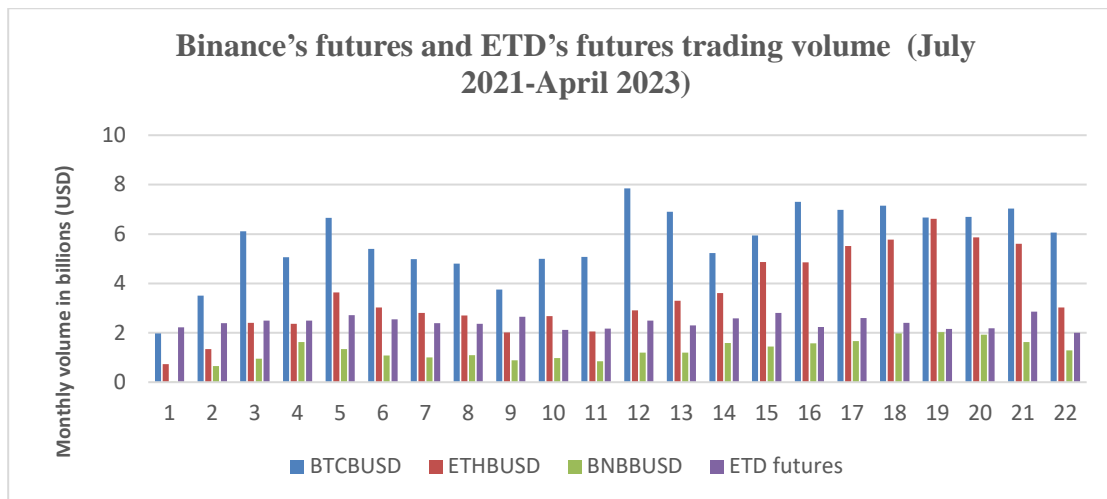


**Source**: Calculated by the authors based on Data from FIA.

Given that the timeframe for our research starts from July 2021, The worldwide volume of exchange-traded futures this month was 2.22 B then gradually increased to reach 2.71 B in November then it kept swinging between 2 B and 2.6 B. The trading volume rose in September 2022 reaching 2.8 B, up 12.6% from last year (FIA, 2023),

then it went down to 2.24 B in October down 10.4% from last year. March 2023 saw a peak increase in futures trading volume with 2.86 B, up 8% from the same month last year.

**Figure 11**: Binance's futures (BTCBUSD, ETHBUSD, and BNBBUSD) and ETD's futures trading volume from (July 2021-April 2023)
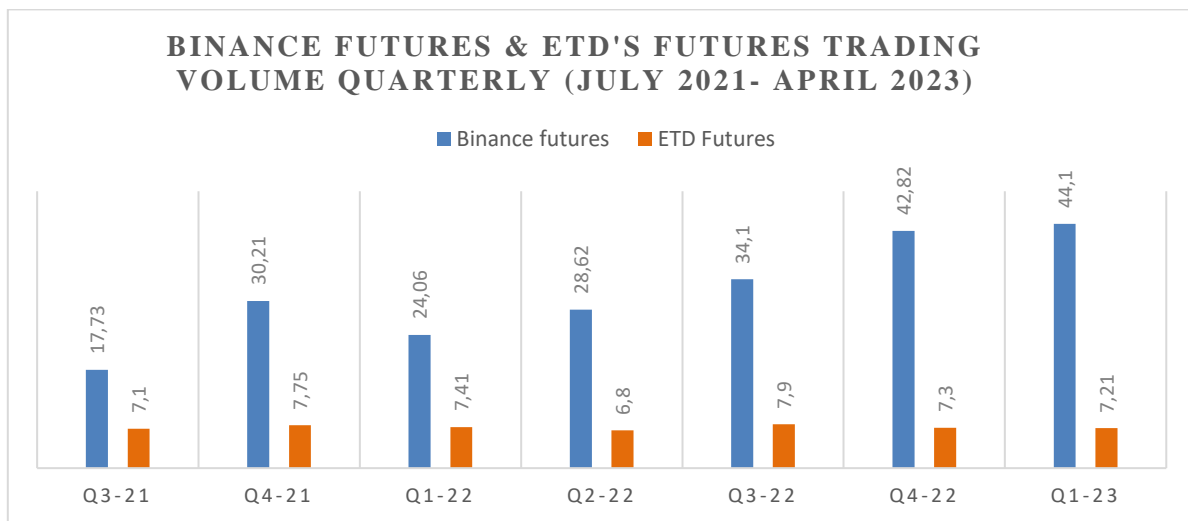


**Source**: Calculated by the authors based on Data from Binance and FIA.

The figure shows a comparison between Binance's most traded cryptocurrencies futures (BTC, ETH, BNB) and the exchange traded futures globally, It's clear that Bitcoin futures trading volume has outperformed exchange-traded contracts by huge amounts for example in June 2022 The BTCBUSD reached 7.85 B with 2.5 B for ETD futures it's a 5.35 B gap, In March 2023, when ETD futures saw a peak increase of 2.86 B, the BTCBUSD trading volume on Binance reached 7.025 B, with a gap of 4.165 B among them.

From November onwards, ETHBUSD trading volume exceeded the trading volume of ETD futures, as it reached 3.63 B against 2.71 B and kept it that way, though with a slight difference between them. In January 2023, ETHBUSD peaked at 6.62 B, with a gap of 4.46 B, and the big difference between them remained until April, when Ethbusd fell dramatically again.

As for BNBBUSD, its transaction volume has always been low compared with the ETD futures, but in January we note that their trading volumes are approaching 2.03 B for BNBBUSD and 2.16 B for the ETD futures, same for the next month.

**Figure 12** : Binance's futures (BTCBUSD, ETHBUSD, and BNBBUSD) and ETD's futures trading volume by quarter.



**BINANCE FUTURES & ETD'S FUTURES TRADING VOLUME QUARTERLY (JULY 2021- APRIL 2023)**

■ Binance futures    ■ ETD Futures

**Source**: Calculated by the authors based on Data from Binance and FIA.

The diagram shows the big gap between the quarterly trading volume for each of the Binance futures (BTCBUSD, ETHBUSD, BNBBUSD) and for the ETD's futures; for Binance, trading volume gradually increased, reaching its peak in the first quarter of 2023 with a value of 44.1 B, compared with 7.21 B for the ETD's futures, whose trading volumes were up and down reaching a peak of 7.9 B in the third quarter of 2022.

## 4. CONCLUSION:

The financial derivatives market is no longer limited to traditional transactions. It has become reliant on digital technologies such as blockchain, artificial intelligence, and big data in trading financial derivatives contracts.

In conclusion and response to the study's key problem, the impact of fintech on financial derivatives has been transformative and multifaceted. Fintech innovations have significantly reshaped the landscape of financial derivatives markets, bringing both benefits and challenges.

On the positive side, Fintech has led to increased accessibility to financial derivatives. Digital platforms, led by Binance and new online markets, have lowered barriers to entry, allowing a broader range of participants, including retail investors, to engage in derivative trading, and this is what the study revealed through comparing trading statistics between Binance and traditional markets. Furthermore, what distinguishes digital trading of derivatives from traditional trading is that it relies on a wide variety of transactions, the underlying assets can include cryptocurrencies such as Binance's futures also the traders can use margin money. These platforms provide the possibility of trading

with financial leverage. All these features help to improve market liquidity and pricing efficiency.

In addition, fintech has facilitated the trading process through digital platforms, as opening an account on Binance or any other platform to trade is considered a very easy step without any costs. It has brought a higher level of efficiency and transparency to the process of trading financial derivatives through its technologies. Which has led to a reduction in operational risks and overall market integrity enhancement.

However, the rapid integration of fintech into derivatives markets has not been without its challenges. Concerns about cybersecurity and data privacy are becoming increasingly evident as digital platforms become central to derivatives trading. Regulatory frameworks have struggled to keep pace with these technological developments, creating potential regulatory gaps and uncertainties, also the rise of financial technology has given rise to new forms of market manipulation and systemic risk. What's more, not all digital trading platforms offer the functionalities that every trader needs. For example, Binance is banned in Japan, UK, Thailand and certain regions in Canada also not all accounts have access to all features in Binance platform.

In closing, the impact of fintech on financial derivatives is a dynamic interaction between increased accessibility, efficiency and transparency, on one side, and potential risks and challenges, on the other. As fintech continues to grow, stakeholders need to work together to harness the benefits of innovation while effectively minimizing the related risks, foster collaboration with experts to understand fintech innovations, develop flexible and adaptive regulations capable of adapting to technological advances and protect traders privacy.

# 5. <u>List of references</u>:

- 5paisa Research Team. (2023, April 20). *What is derivative trading?* Retrieved from 5paisa: https://www.5paisa.com/stock-market-guide/derivatives-trading/what-is-derivative-trading#:    . Consulted on August 01, 2023.
- Arditti, F. (1996). *Derivatives: A Comprehensive Resource for Options, Futures, Interest Rate swaps, and Mortgage securities.* Boston Massachusetts: Harvard Business School Press.
- Bala, M., & al. (2021). *Chapter : Blockchain-Based IoT Architecture for Software-Defned Networking from Blockchain, Artificial intelligence, and the internet of thing: Possibilities and Opportunities.* (S. I. Publishing, Éd.) Switzerland.
- Baltgailis, J., & Simakhova, A. (2022). The technological innovations of Fintech companies in ensuring the stability of the financial system in pandemic times. *Marketing and Management of Innovations*.
- Bambara, J., & Allen, P. (2018). *Blockchain A Practical Guide to Developing Business, Law, and Technology Solutions* (1 ed). McGraw-Hill Education.
- Binance. (2021, July 27). *What Are Perpetual Futures and Quarterly Futures*. Retrieved from Binance:   https://www.binance.com/en/support/faq/what-are-perpetual-futures-and-quarterly-futures-d2a1afd5f829455c9ded23f0ca561a40. Consulted on March 04, 2023.

- Binance. (2021, July 26). *What Are USDⓈ-Margined Futures and Coin-Margined Futures*. Retrieved from Binance: https://www.binance.com/en/support/faq/what-are-usdⓈ-margined-futures-and-coin-margined-futures. Consulted on June 03, 2023.
- Binance. (2022, August 05). *How to Make Your First Trade on Binance Futures?* Retrieved from Binance: https://www.binance.com/en/blog/futures/how-to-make-your-first-trade-on-binance-futures-4199062775325595641 . Consulted on August 13, 2023.
- Binance. (2022, Nov 16). *Introduction to Binance Options*. retrieved from Binance: https://www.binance.com/en-ZA/support/faq/introduction-to-binance-options-374321c9317c473480243365298b8706 . Consulted on March 04, 2023.
- Binance. (2022, July 04). *KYC in Crypto - A comparison*. Retrieved from Binance: https://www.binance.com/en/blog/community/kyc-in-crypto--a-comparison-421499824684904092 . Consulted on March 05, 2023.
- Binance. (2023). from Binance: https://www.binance.com/en . Consulted on March 04, 2023.
- Boluze, L. (2019, June 11). *Swap : définition et fonctionnement*. Retrieved from Capital.fr: https://www.capital.fr/entreprises-marches/swap-1341543 . Consulted on August 07, 2023.
- Chartrand, G., & al. (2017). Deep Learning: A Primer for Radiologists. *RadioGraphics, vol 37*(2).
- Chassagnon,, G., & al. (2019). Deep learning: definition and perspectives for thoracic imaging. *European Radiology*.
- Clinbelle, K. (2023, Feb 02). *Binance review*. Retrieved from Investopedia: https://www.investopedia.com/binance-review-5209980 . Consulted on March 04, 2023.
- Coinbase. (n.d.). *What is cryptocurrency ?* ,Retrieved from Coinbase: https://www.coinbase.com/learn/crypto-basics/what-is-cryptocurrency . Consulted on March 03, 2023.
- CoinMarketCap. (2023). *BNB*. Retrieved from CoinMarketCap: https://coinmarketcap.com/currencies/bnb/ . Consulted on Juin 14, 2023.
- De Mauro, A., & al. (2015). What is Big Data? A Consensual Definition and a Review of Key Research Topics. *International Conference on Integrated Information (IC-ININFO 2014) AIP Conf. Proc.* Madrid, Spain.
- FIA. (2023, July 26). *ETD Volume Reports*. Retrieved from FIA: https://www.fia.org/etd-volume-reports?page=0 . Consulted on August 14, 2023.
- Financial Stability Board. (2022, May 05). *Fintech*. Retrieved from Financial Stability Board: https://www.fsb.org/work-of-the-fsb/financial-innovation-and-structural-change/fintech/ . Consulted on December 12, 2022.
- Frankenfield, J. (2023). *Binance Coin (BNB) Uses, Support, and Market Cap*. Retrieved from Investopedia: https://www.investopedia.com/terms/b/binance-coin-bnb . Consulted on June 14, 2023.
- Gupta, S. (2017). *Financial derivatives : Theory, concepts and problems* (2 ed.). Delhi: PHI Learning Pvt.
- Haiss, P., & Sammer, B. (2010). The Impact of Derivatives Markets on Financial Integration, Risk, and Economic Growth. *Athenian Policy Forum 10th Biennial Conference on "Regulatory Responses to the Financial Crisis"*. Frankfurt: Bundesbank.
- Help with Penny. (2023, Feb 01). *Complete list of Binance Supported Countries (UPDATED 2023)*. Retrieved from Help with Penny: https://helpwithpenny.com/binance-supported-countries . Consulted on March 05, 2023.
- IG. (n.d.). *What are derivatives and how do you trade them?* Retrieved from IG: https://www.ig.com/en/trading-need-to-knows/what-are-derivatives#:~:text=Derivatives. Consulted on August 01, 2023.
- INDmoney. (2022, Dec 30). *Know what are derivatives in trading and how to do derivatives trading in India*. Retrieved from INDmoney: https://www.indmoney.com/articles/stocks/know-what-are-derivatives-in-trading-and-how-to-do-derivatives-trading-in-india? Consulted on Aug 01, 2023.
- Investing.com. (2023). *Bitcoin*. Retrieved from Investing.com: https://sa.investing.com/crypto/bitcoin/historical-data . Consulted on June 09, 2023.

- Investing.com. (2023). *BNB- Binance Coin*. Retrieved from Investing.com: https://sa.investing.com/crypto/bnb/historical-data. Consulted on June 15, 2023.
- Investing.com. (2023). *Ethereum*. Retrieved from Investing.com: https://sa.investing.com/crypto/ethereum/historical-data. Consulted on June 09, 2023.
- Jakhar, D., & Kaur, I. (2019). Artificial intelligence, machine learning & deep learning: Definitions and differences. *Clinical and Experimental Dermatology*.
- Kadikar, V. (2021, April 27). *What Are Traditional Financial Derivatives?* Retrieved from mondaq: https://www.mondaq.com/uk/commoditiesderivativesstock-exchanges/1061944/what-are-traditional-financial-derivatives . Consulted on  August 01, 2023.
- Kolb, R., & Overdahl, J. (2002). *Financial derivatives* (3 ed.). Wiley.
- Kuzmina, O., & al. (2021). *Chapter: Derivatives Trading: Digital Transformation, Book: Engineering Economics: Decisions and Solutions from Eurasian Perspective* (Vol. Vol 139). (Springer, Ed.) Switzerland.
- Ledesma,, L. (2023, Feb 03). *Crypto Derivative Volumes Saw Speedy Growth as Prices Rose in January*. Retrieved from CoinDesk: https://www.coindesk.com/markets/2023/02/08/crypto-derivative-volumes-saw-speedy-growth-as-prices-rose-in-january. Consulted on March 03, 2023.
- McAughtry, L. (2023, January 27). *Derivatives volumes are up – and it's giving the buy-side a headache*. Retrieved from The trade: https://www.thetradenews.com/derivatives-volumes-are-up-and-its-giving-the-buy-side-a-headache/. Consulted on March 03, 2023.
- Mohammed Salih, K., & al. (2022). Comprehensive Survey on the Internet of Things with the Industrial Marketplace,. *Sensors, Vol 22*(3).
- Murinde, V., & al, e. (2022). The impact of the FinTech revolution on the future of banking: Opportunities and risks. *International Review of Financial Analysis, Vol 81*.
- Paolini, A. (2020). The Disruptive Effect of Distributed Ledger Technology and Blockchain in the over the Counter Derivatives Market. *Global Jurist, 20*(2).
- Rashid , A., & Chaturvedi, A. (2019). Cloud Computing Characteristics and Services: A Brief Review. *International Journal of Computer Sciences and Engineering, Vol 7*.
- Rusinko, C., & Matthews, J. (1998). Financial Losses Due to Financial Derivatives: A Problem of Technology Transfer*. *Journal of Technology Transfer, Vol 23*(3).
- Statista research department. (2022). *Number of futures and options contracts traded globally 2013-2021*. Retrieved from Statista: https://www.statista.com/statistics/377025/global-futures-and-options-volume . Consulted on December 11, 2022.
- Tun, Z. (2022, April 25). *Examples of Exchange-Traded Derivatives*. Retrieved from Investopedia: https://www.investopedia.com/articles/active-trading/032515/examples-exchangetraded-derivatives.asp. Consulted on August 14,2023.
- Varma, J. (2019). Blockchain in finance. *Vikalpa:The journal for decision makers, 44*(1).
- Wilson, T., & Howcroft, E. (2022). *Binance withdrawals hit $1.9 bln in 24 hours, data firm say*. Retrieved from Reuters: https://www.reuters.com/technology/binance-sees-withdrawals-19-billion-last-24-hours-data-firm-nansen-says-2022-12-13/ . Consulted on June 06, 2023.
- Zucchi, K. (2022, August 23). *Derivatives 101*. Retrieved from Investopedia: https://www.investopedia.com/articles/optioninvestor/10/derivatives-101.asp . Consulted on August 01, 2023.
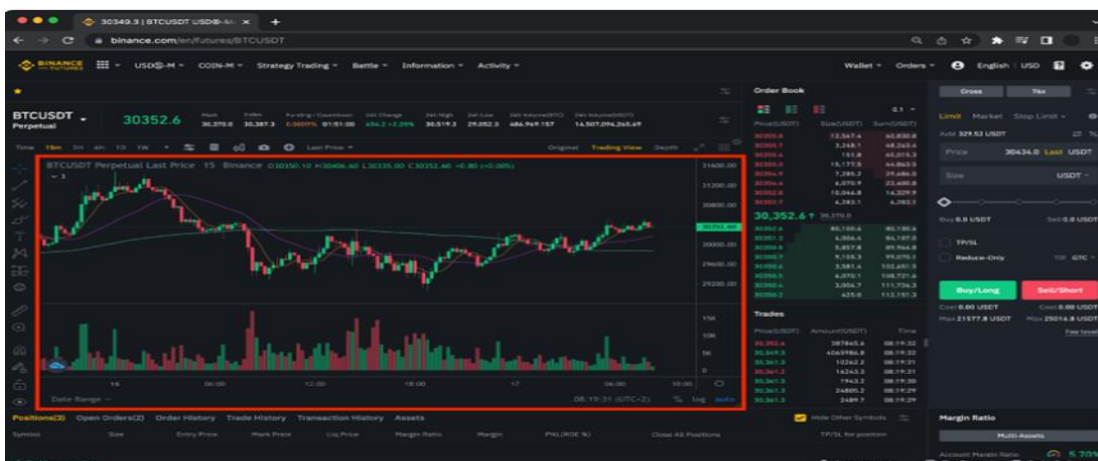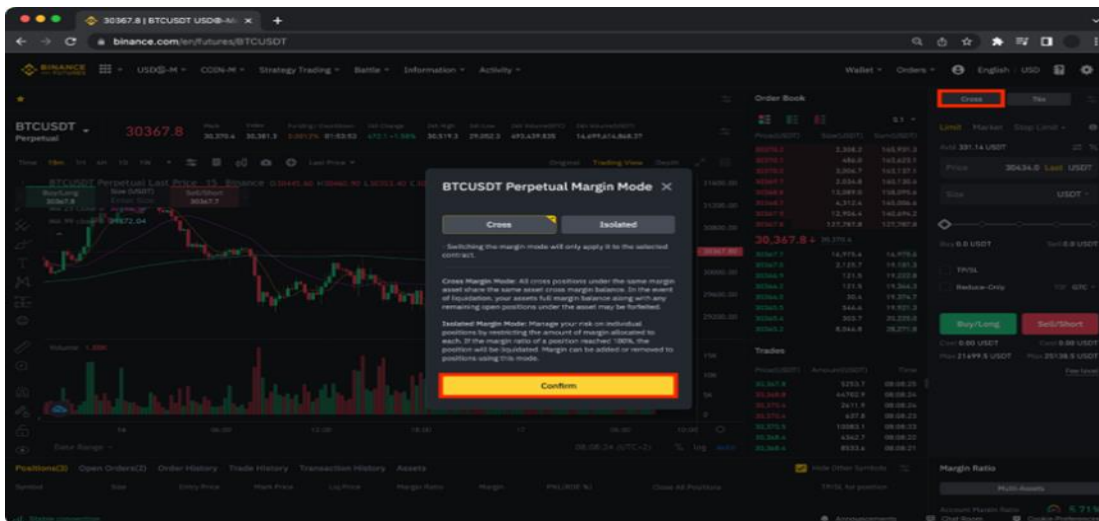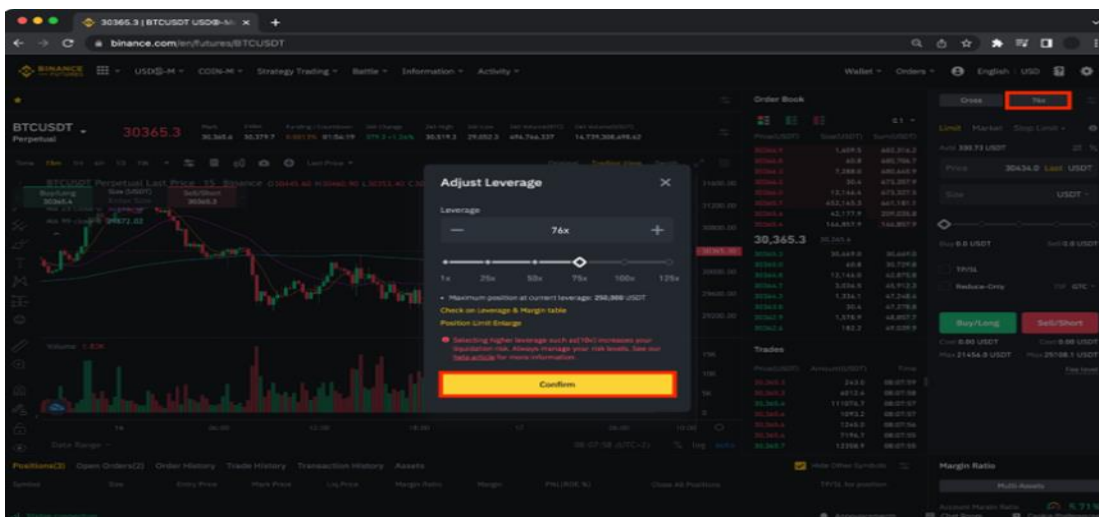
# 6. Annexes:

Annexe N° 01
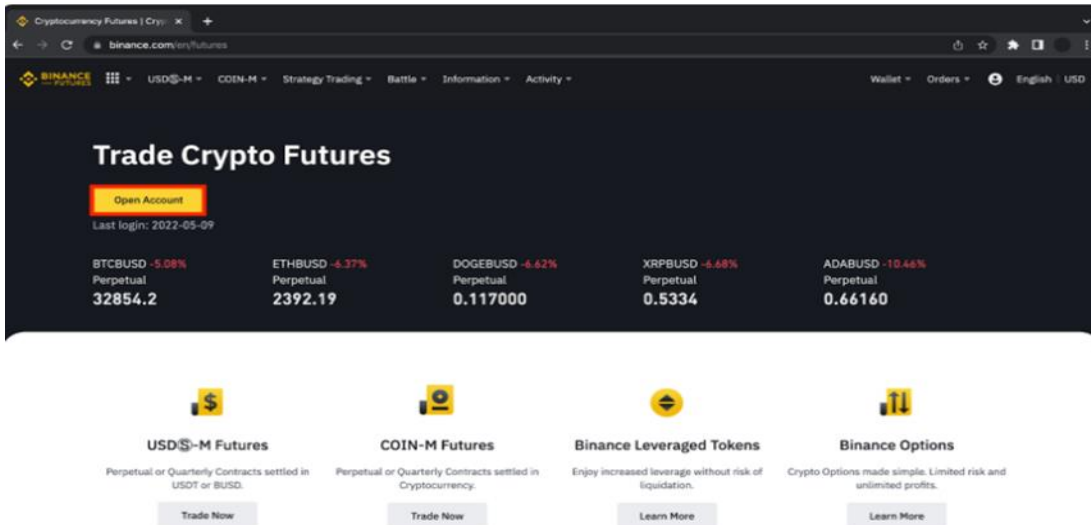


Annexe N° 02
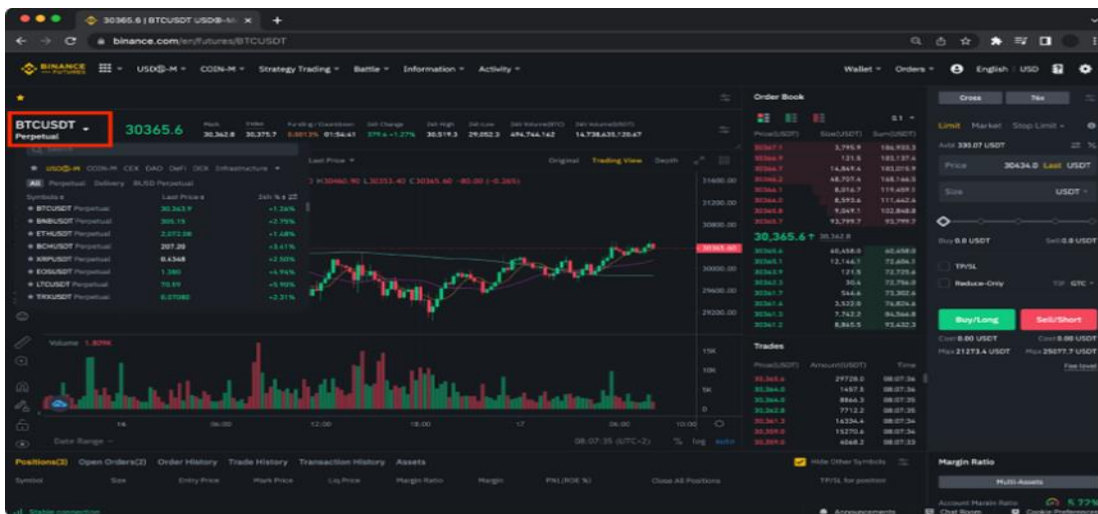


Annexe N° 03

Annexe N° 04



Annexe N° 05



Annexe N° 06