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Chapter 1—Introduction to Disruptive Finance

Answers to End of Chapter Questions

1. Identify the characteristics of blockchain.
- LO 01-03
- Topic: Blockchain
- Business Competency: Knowledge Application
- Bloom's: Level 2 Understand
- Difficulty: Medium 2

The key characteristics of blockchain include:
- Decentralized and distributed: Every blockchain is a distributed record-keeping system stored across thousands of nodes and devices. The database operates without centralized control.
- Immutable records: Information stored on the blockchain cannot be changed, altered, or hacked.
- Transparency: The blockchain ledger can be viewed by anyone, and all transactions recorded are entirely traceable and transparent.
- Real-time data transmission: Information analyzed, processed, and validated on a distributed basis is stored on an immutable ledger and shared in real-time with all network members.
- Consensus-driven: Blocks of new information are only added through group consensus and secured with cryptography.

2. What are the characteristics of a good currency? Does bitcoin share these characteristics? Why or why not?
- LO 01-05
- Topic: Currency
- Business Competency: Analytical Thinking
- Bloom's: Level 5 Evaluate
- Difficulty: Hard 3

A good currency should have the following seven characteristics:
- Acceptability: Bitcoin is not universally accepted by retailers, requiring workarounds like PayPal selling crypto to pay retailers in fiat.
- Portability: Bitcoin is electronically portable only.
- Durability: Bitcoin does not decay and theoretically persists over time.
- Divisibility: Bitcoin is very divisible.
- Homogeneity (Fungibility): Each bitcoin is the same (fungible).
- Recognizable: Bitcoin has verification processes to validate its authenticity.
- Stability: Bitcoin's value versus the U.S. dollar has varied widely, showing high volatility, which is inconsistent with currency stability.

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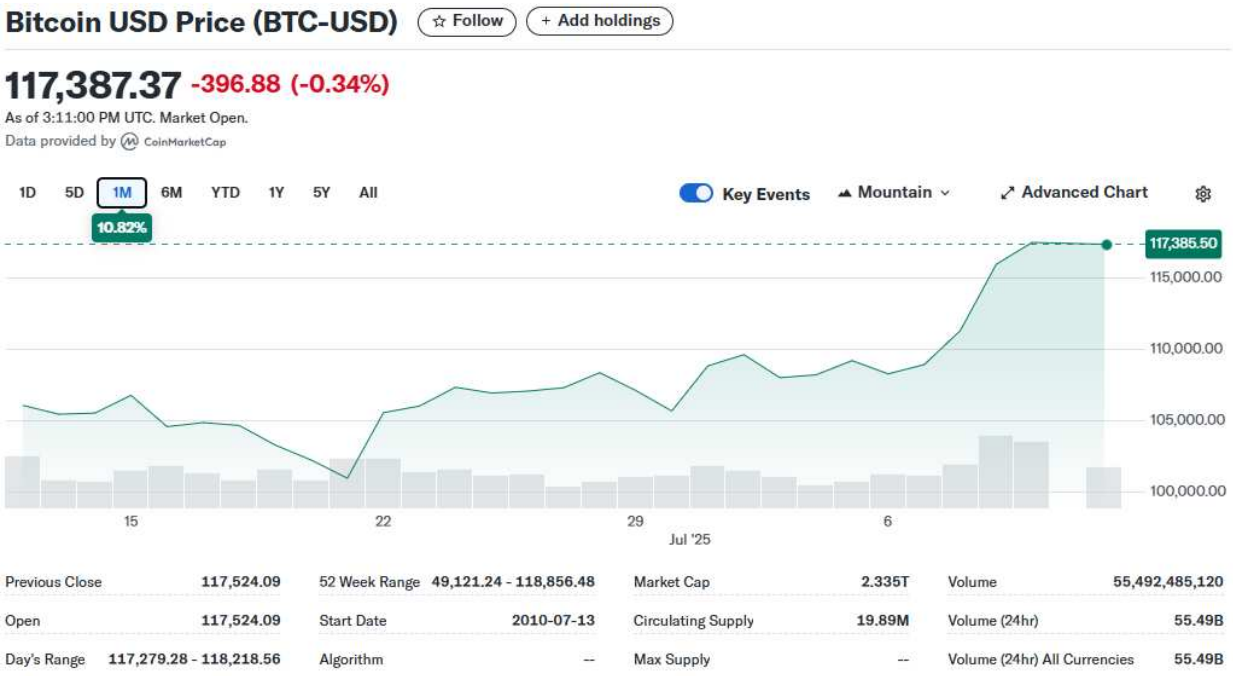
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Bitcoin appears to fail in the two key areas of *acceptability* and *stability* as a good currency. While it meets other characteristics like portability, durability, divisibility, homogeneity, and recognizability, its limited universal acceptance and significant price volatility prevent it from being classified as a stable currency. Cryptocurrency advocates, however, also believe a good currency should have a limited amount to prevent devaluation by central banks, a characteristic Bitcoin is designed to possess.

3. Investigate the price and volume of bitcoin on Yahoo! Finance (https://finance.yahoo.com/quote/BTC-USD?p=BTC-USD). Examine the one- and six-month charts. Comment on the trend and volatility of bitcoin's price during this time period.

- LO 01-03
- Topic: Bitcoin Price and Volatility
- Business Competency: Knowledge Application
- Bloom's: Level 4 Analyze
- Difficulty: Medium 2

One month price chart:



Yahoo! Finance
https://finance.yahoo.com/quote/BTC-USD/
Obtained July 12, 2025

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The one-month price chart shows that bitcoin's trend has generally been up. The price at the beginning of the month was approximately $106,000 and ended the month at about $117,000 for a monthly return of over 10%. There is also some volatility as the price dropped to $101,000 before recovering.

Six-month price chart:



Yahoo! Finance
https://finance.yahoo.com/quote/BTC-USD/
Obtained July 12, 2025

The six-month chart also shows an upward trend, but includes much more volatility. The period began with bitcoin's price around $95,000. However, on two occasions, the price dropped below $80,000 before finally increasing to around $117,000 by the end of the period.

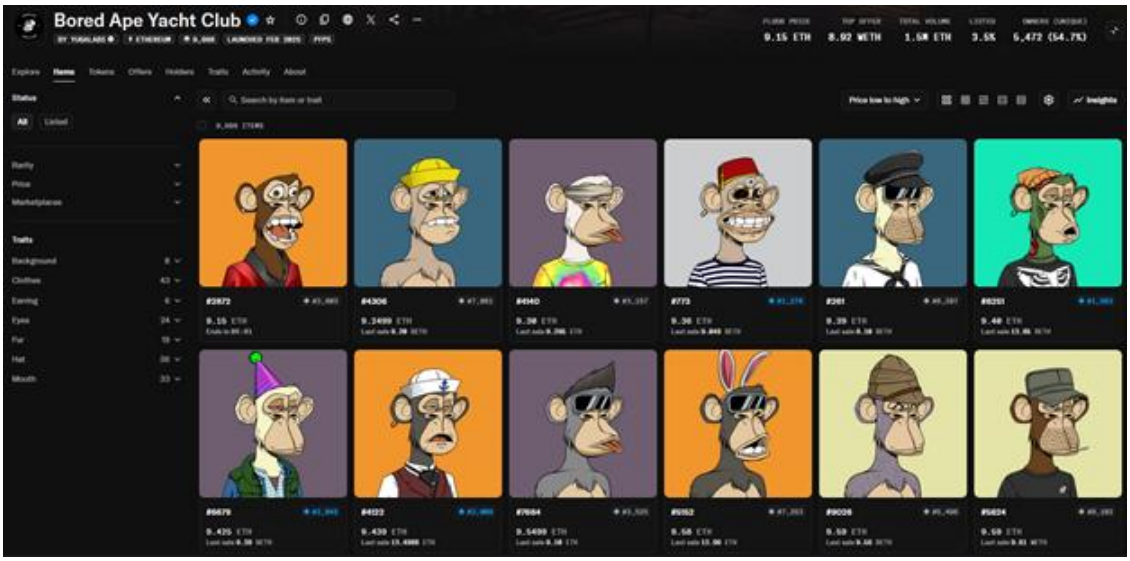
4. Go to NFT trading exchange OpenSea (https://opensea.io/) and search for the trading of "Bored Ape Yacht Club" NFTs. What is the current price for a Bored Ape Yacht Club non-fungible token?

- LO 01-04
- Topic: NFTs
- Business Competency: Knowledge Application
- Bloom's: Level 3 Apply
- Difficulty: Medium 2

On September 11, 2025, OpenSea showed the sales depicted below.

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The screenshot shows current Bored Ape Yacht Club NFTs for sale. For example, sad looking #4306 shows that it is for sale for 9.2499 ETH. At this time, each ETH is valued at $4,435.03. Interested people could make a bid anytime during the next 7 days. The last time it sold, it sold for 9.20 BETH. Clicking on the Ape shows more details, like the details of its selling history.

5. Examine the statistics for Ethereum at https://www.blockchain.com/explorer/assets/eth .
   A. What is the current price?
   B. How many are circulating?
   C. Examine the rapidly occurring transactions. What is a common range of transaction values (Lower end to Higher end)?

- LO 01-05
- Topic: Ethereum
- Business Competency: Knowledge Application
- Bloom's: Level 3 Apply
- Difficulty: Medium 2

A to C:

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Blockchain.com
https://www.blockchain.com/explorer/assets/eth
Obtained July 12, 2025

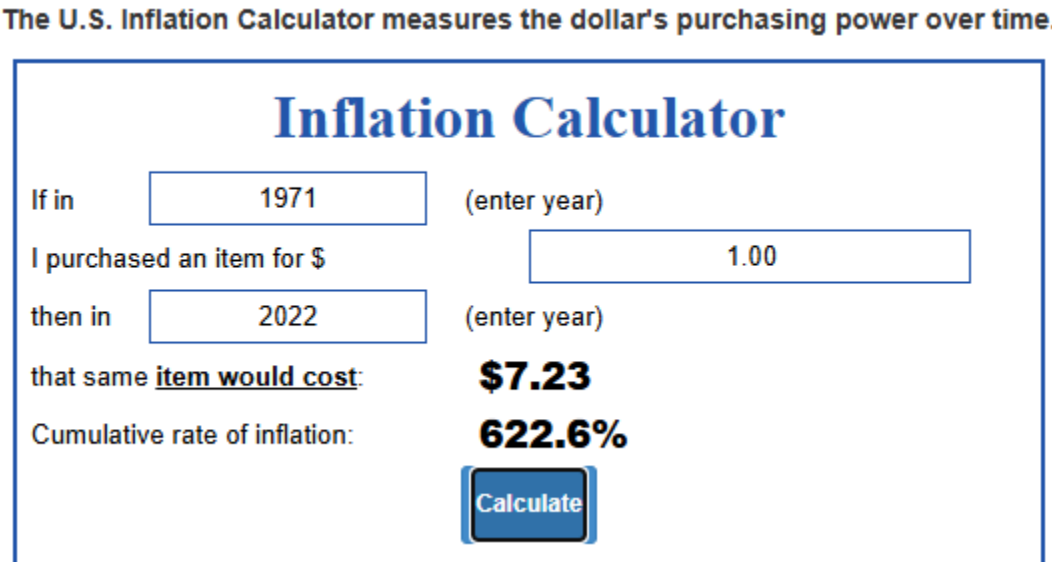
The screenshot shows that ETH was priced at $2,928.27, which was a -0.58% decline from the day before. The 24-hour high and low was $3,004.81 and $2,928.17, respectively. The supply of Ether at that time was 120,715,200 and there was $25,302,979,806 worth of ETH traded in the previous 24 hours.

6. Use the U.S. inflation calculator at https://www.usinflationcalculator.com/ compute the inflation since the U.S. went off the gold standard in 1971 to 2022.

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- LO 01-01
- Topic: Inflation
- Business Competency: Knowledge Application
- Bloom's: Level 3 Apply
- Difficulty: Medium 2



US INFLATION CALCULATOR

https://www.usinflationcalculator.com/
Obtained July 12, 2025

The screenshot shows that a basket of goods costing $1 in 1971 cost $7.23 in 2022. This represents a 622.6% increase over the period. This illustrates how inflation can dramatically devalue the dollar over time.

7. What are some non-finance applications of NFTs?
- LO 01-04
- Topic: NFTs
- Business Competency: Knowledge Application
- Bloom's: Level 3 Apply
- Difficulty: Medium 2

Non-finance applications of NFTs include:
- Gaming: Early popular NFTs like CryptoKitties and gaming characters.
- Exclusive Social Organizations/Memberships: Examples like the Bored Ape Yacht Club (BAYC) where owning an NFT grants membership
- Authentication of Artwork: Original artists can create NFTs for physical art to authenticate ownership and provide transaction history, potentially reducing counterfeiting. Examples include CryptoPunks sold at auction houses.
- Digital Collectibles/Video Highlights: The National Football League sells ownership of its videos and collectibles (Moments) through NFTs via NFL ALL DAY.

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- Safekeeping, Ownership, and Control of Records: NFTs can be used for vital records such as birth certificates, medical records, Social Security cards, university transcripts, and patents. These NFTs are generally accessed by the owner for verification rather than traded.

8. What have been the ramifications to date of the crypto sector receiving only light or no regulation?
- LO 01-06
- Topic: Regulation
- Business Competency: Knowledge Application
- Bloom's: Level 2 Understand
- Difficulty: Medium 2

The light or lack of regulation in the crypto sector has led to several significant ramifications. One major consequence is the proliferation of scams and lower-quality projects. Without comprehensive oversight, fraudulent activities have become more prevalent, and many mediocre or risky ventures have managed to enter the market unchecked.

A prominent example of regulatory intervention involves fraudulent Initial Coin Offerings (ICOs). The U.S. Securities and Exchange Commission (SEC) has stepped in to address such cases, like the Centra Tech incident. Here, the founders faced criminal charges, substantial fines, and jail sentences, while celebrity promoters received penalties for failing to disclose payments for their endorsements.

Another critical issue has been the vulnerability of centralized crypto exchanges. The collapse of several major platforms in 2022 (including FTX, Celsius Network, and Voyager Digital) highlighted the risks inherent in operating outside traditional banking regulations, insurance requirements, and disclosure rules. Customers were left exposed and unprotected when these firms could not meet withdrawal demands or when fraudulent activities surfaced.

In addition, the crypto sector has struggled with a lack of standardized accounting practices. Many firms within the industry have bypassed Generally Accepted Accounting Principles, opting instead for workarounds such as supplemental footnotes or maintaining separate records. This approach has hindered transparent and reliable financial reporting.

Finally, repeated incidents of hacks, breaches, scams, and negative headlines have eroded investor confidence. Both centralized and decentralized firms have contributed to this trend, drawing critical scrutiny from regulators and making it clear that the sector's "wild west" approach to oversight comes at a substantial cost.

9. What is the typical crowdfunding loan matching process for borrowers and lenders?
- LO 01-08
- Topic: Crowdfunding
- Business Competency: Knowledge Application
- Bloom's: Level 1 Remember

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- Difficulty: Medium 2

The typical crowdfunding loan matching process for borrowers and lenders is composed of several distinct steps.

First, borrowers begin by providing detailed information about their loan needs, specifying the amount they require, the purpose of the loan, and their financial background. This information is submitted to the platform along with desired interest rates, setting the stage for the evaluation process.

Next, the Peer-to-Peer (P2P) lending platform carefully assesses the creditworthiness of each borrower. This evaluation is based on established financial criteria, such as their credit scores and historical financial behavior, to determine their reliability as a potential loan recipient.

On the other side, lenders create their own profiles, outlining their willingness to participate, the amount they are looking to invest, and their tolerance for different levels of risk. This helps the platform align the preferences and requirements of both parties.
The platform then moves to the matching phase, where it pairs borrowers with lenders whose profiles and preferences best complement one another. Frequently, a single loan is funded by contributions from several lenders, each offering a small portion of the total amount.

Once a match is established and the loan is funded, borrowers repay the loan in installments according to the terms agreed upon through the platform. The platform then distributes the principal and interest payments among the contributing lenders, proportional to each lender's contribution.

Finally, it is important to note that P2P lending platforms typically charge fees for their services, which can range between 1% and 6%. These fees are usually deducted from either the loan amount or the repayments, depending on the platform's policies.

10. Discuss how Artificial Intelligence is being used to advise people on investment and portfolio decisions.
- LO 01-10
- Topic: Robo-advising
- Business Competency: Knowledge Application
- Bloom's: Level 2 Understand
- Difficulty: Medium 2

Artificial Intelligence is significantly transforming how people receive investment and portfolio advice, primarily through "robo-advising." Robo-advisors are automated platforms that leverage technology and algorithms to optimize investment strategies, making professional financial advice more accessible and cost-effective.

Here's how AI is used:

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- Personalized Advice: Investors input their financial goals, risk tolerance, and preferences into the digital platform. AI algorithms then use this information to create a diversified investment portfolio tailored to the individual's needs.
- Automated Management: AI enables automation of tasks, reducing costs and providing a more efficient and transparent way to manage investments This includes quicker decision-making, automated rebalancing of portfolios, and continuous optimization of investment strategies.
- Accessibility and Cost-Effectiveness: By replacing or augmenting human financial advisors with AI, advice becomes more affordable and accessible to a broader audience who might otherwise not be able to afford traditional wealth management services.
- Risk Management: AI-powered systems can analyze vast amounts of financial data to manage risks in real-time within these portfolios.

However, the chapter also raises questions about the ethical implications and trustworthiness of AI robo-advice, including potential legal liability for automated wealth management practices and the need for clear classification, reporting, and disclosure standards.

Case Study

Fintech Skepticism and Acceptance in the 21st Century

The turn of the 21st century marked a significant inflection point for the financial industry. Building on decades of foundational technological advancements, the period from 2000 to the present has seen the rapid emergence and increasing societal acceptance of "Fintech." This era is characterized by innovations like mobile banking, digital payments, peer-to-peer lending, and crucially, the rise of transformative technologies such as Blockchain (including cryptocurrencies), Artificial Intelligence (AI), and Machine Learning (ML).

However, the journey of Fintech from niche innovations to mainstream adoption has been far from smooth. Alongside its revolutionary potential, it has faced substantial criticism and skepticism from various stakeholders, like traditional financial institutions, regulators, consumers, and even within the tech community itself. This case study will explore the trajectory of Fintech acceptance since 2000, critically examining both the drivers of its adoption and the persistent challenges and objections that have shaped its evolution.

Phase 1: Digital Disruption and the Post-2008 Catalyst (2000–2010s)

The early 2000s saw the internet become an increasingly utilized platform for financial services. Companies like PayPal, founded in 1998, began to revolutionize online payments, offering a more convenient alternative to traditional methods.

Important innovations during this period include the widespread adoption of broadband internet. Then smartphones (especially after 2007) facilitated the rise of digital banking interfaces. Consumers increasingly valued the convenience of managing finances anywhere, anytime, driving high adoption rates for mobile banking apps. Beyond online shopping, digital payments extended to person-to-person (P2P) transfers (e.g., Venmo, Square Cash), making splitting bills and informal money transfers significantly easier. Platforms also emerged that connected

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individual lenders directly with borrowers, known as P2P Lending, often offering more flexible terms than traditional banks. This provided an alternative financing channel.

These innovations were met with both enthusiasm and skepticism. Some of the criticisms centered on security, trust, and financial risks. For example, early concerns centered on the security of online transactions and mobile apps. How secure was sensitive financial data on the internet or a smartphone? Fears of hacking, phishing, and identity theft were prevalent. Also, consumers and regulators were wary of non-bank entities handling financial transactions. Could a startup be as reliable and secure as a long-established bank? Lastly, concerns arose regarding the credit risk associated with P2P loans, as many borrowers were those rejected by traditional banks. The lack of government insurance for lenders (unlike bank deposits) meant higher risk of default.

Phase 2: The Rise of Transformative Technologies—Blockchain, AI, and ML (Late 2010s - Present)

This period saw the emergence and increasing exploration of technologies that promised to fundamentally reshape finance.

Blockchain & Cryptocurrency

The promise of disintermediation, enhanced transparency, immutable record-keeping, and faster, cheaper cross-border transactions spurred interest in the financial applications of blockchain. Financial institutions began exploring private blockchains for clearing and settlement, trade finance, and supply chain management. The significant market capitalization growth of cryptocurrencies (reaching trillions of USD) also drew institutional and retail investors. This new industry was initiated by the introduction of the Bitcoin Blockchain (2009) with its decentralized digital currency. The Ethereum Blockchain (2015) expanded blockchain's utility beyond currency to "smart contracts" and decentralized applications (dApps), attracting wider attention from various industries, including finance.

Artificial Intelligence (AI) & Machine Learning (ML)

While quantitative firms used algorithmic trading for decades, the availability of vast datasets and increased computing power in the 2010s truly propelled AI/ML in finance. AI's ability to analyze massive datasets quickly and identify subtle patterns makes it invaluable for detecting fraudulent transactions and assessing credit risk with greater accuracy than traditional methods. This directly translates to cost savings and reduced losses for financial institutions. AI and ML algorithms allow for inexpensive personalized financial services as they can analyze individual spending habits, financial goals, and risk tolerance to offer tailored product recommendations and automated investment advice. Robo-advisors like Betterment and Wealthfront brought wider access to professional wealth management, which appeals to younger generations and those with smaller portfolios. Even the algorithmic trading used exclusively by hedge funds to execute trades at high speeds and optimize strategies became available to retail investors.
These innovations were also met with both enthusiasm and skepticism. The first widely held cryptocurrencies experienced extreme price fluctuations which make them highly speculative and challenge their utility as useful currencies or stores of value. In addition, their perceived anonymity and decentralized nature raised concerns about their use for money laundering,

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terrorism financing, and other illegal activities. Regulators struggle to fit these novel assets into existing frameworks, leading to "regulatory arbitrage" where entities operate in less regulated spaces. Also, while blockchain itself is secure, the exchanges and wallets where cryptocurrencies are stored have been frequent targets of high-profile hacks, leading to significant financial losses and eroding trust. Lastly, Bitcoin's energy-intensive "Proof-of-Work" consensus mechanism draws substantial environmental criticism.

AI/ML has also received much critical attention. A pervasive concern is that AI algorithms, trained on historical data, can inherit and amplify existing societal biases (e.g., racial, gender, socioeconomic). This could lead to discriminatory outcomes in lending decisions, credit scoring, or insurance pricing. Many AI/ML models operate as "black boxes," meaning their decision-making processes are obscure and difficult to interpret or explain. In finance, decisions impact livelihoods and thus we need to understand *why* an AI made a particular decision (e.g., denying a loan), which is known as "Explainable AI" (XAI). Failing to explain the reasons for AI decisions poses significant challenges for accountability, auditing, and regulatory compliance. AI relies on vast amounts of personal and financial data to make its decisions. This raises serious concerns about data privacy, cybersecurity vulnerabilities, and the ethical use of sensitive information. Indeed, robust ethical frameworks and governance structures have not kept up with the rapid advancement and deployment of AI in finance.

The future of fintech acceptance will largely depend on its ability to demonstrate tangible benefits while effectively addressing these legitimate concerns, ultimately building greater trust and confidence across all segments of society.

1. Discuss the inherent tension between the innovative potential of blockchain/cryptocurrencies and the regulatory desires for stability, consumer protection, and anti-money laundering controls. What are some specific regulatory challenges, and how might they be addressed?

- LO 01-06
- Topic: Blockchain regulation
- Business Competency: Knowledge Application
- Bloom's Level: Level 4 Analyze
- Difficulty: Hard 3

2. The innovative promise of blockchain and cryptocurrencies often collides with regulators' mandates for financial stability, consumer protection, and robust anti-money laundering controls. Cryptocurrencies' pseudonymous transactions make it difficult to trace illicit flows, while their borderless nature allows actors to exploit inconsistently regulated jurisdictions. To address these challenges, regulators can require on-ramp providers such as exchanges and wallet services to enforce uniform know-your-customer and AML standards, establish international cooperation through bodies like the Financial Action Task Force, and create sandbox environments where blockchain innovations are tested under supervisory oversight. Mandating independent smart-contract audits and developing insurance schemes for users can further bolster trust without stifling growth.

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3. The “black box” problem and algorithmic bias are significant criticisms of AI/ML in finance. Provide a hypothetical scenario where AI bias in lending could lead to discriminatory outcomes.

- LO 01-08
- Topic: AI bias
- Business Competency: Knowledge Application
- Bloom’s Level: Level 5 Evaluate
- Difficulty: Hard 3

Imagine a bank deploying an AI credit-scoring model trained on ten years of historical loan data that inadvertently reflects past underwriting biases against a particular zip code. Although local economic conditions have improved, the AI continues flagging applicants from that area as high risk solely because earlier data showed elevated default rates. As a result, qualified borrowers in that community face unjust denials, reinforcing a cycle of financial exclusion and economic disparity. This outcome highlights how an opaque model can perpetuate systemic bias without anyone explicitly programming discriminatory rules.

4. Why is “Explainable AI” (XAI) particularly crucial in the financial sector, and what are the challenges in implementing it?

- LO 01-08
- Topic: Explainable AI
- Business Competency: Knowledge Application
- Bloom’s Level: Level 2 Understand
- Difficulty: Hard 3

Explainable AI is essential in finance because lending, insurance, and investment decisions directly affect people’s livelihoods and require clear justification. When a customer’s loan application is denied, both the individual and regulators need to understand the rationale to ensure fairness and enable appeals. However, high-performance models like deep neural networks trade interpretability for accuracy, making it difficult to produce human-readable explanations without undermining performance. Additionally, revealing the data patterns behind decisions can raise privacy concerns, and the absence of standardized formats for AI explanations hinders consistent auditing and regulatory approval.

5. While mobile banking and digital payments are widely accepted due to convenience, what are some remaining barriers or persistent skepticisms that prevent universal adoption, especially among certain demographics?

- LO 01-07
- Topic: Mobile banking
- Business Competency: Knowledge Application
- Bloom’s Level: Level 4 Analyze
- Difficulty: Hard 3

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Mobile banking and digital payments have become mainstream conveniences, yet gaps persist among older adults, rural residents, and low-income users. Security fears—such as phishing schemes, SIM-swap attacks, and device theft—continue to discourage some from fully embracing digital channels. In areas with spotty broadband or cellular coverage, the lack of reliable connectivity makes app-based banking impractical, while those without smartphones must rely on costly alternatives or remain unbanked. Cultural habits and a preference for cash, coupled with concerns over digital footprints among undocumented individuals, further slow universal adoption.

6. Disruption vs. Collaboration: Analyze the relationship between traditional financial institutions and fintech startups since 2000. Has it been primarily one of disruption, collaboration, or a combination of both? Provide examples to support your argument.

- LO 01-02
- Topic: FinTech disruption
- Business Competency: Knowledge Application
- Bloom's Level: Level 5 Evaluate
- Difficulty: Hard 3

Since 2000, fintech startups initially disrupted traditional banks by offering faster peer-to-peer lending and digital payment solutions, forcing incumbents to modernize legacy systems. Over time, however, the relationship has shifted toward collaboration: banks now provide chartered infrastructure and regulatory expertise through banking-as-a-service platforms, while FinTechs contribute agility and customer-centric innovation. Open banking regulations have encouraged API integration, enabling fintech firms to build budgeting tools and personalized services on top of bank data. Today's ecosystem features co-development initiatives—such as bank-sponsored accelerators—and strategic partnerships that blend the strengths of both incumbents and newcomers.

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