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BITCOIN'S TAXONOMY

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Amalian A. W., Bondarenko O. S. Bitcoin's Taxonomy

Bitcoin, the first and best known decentralized digital coin, has sparked a global debate regarding its fundamental nature and appropriate categorization. Since its inception in 2009, bitcoin has defied easy classification, exhibiting characteristics that blur the lines between traditional asset classes. This lack of a clear, universally accepted categorization has significant implications for regulation, taxation, accounting practices, and the broader understanding of bitcoin's role in the evolving financial landscape. This article delves into the multifaceted nature of bitcoin, focusing on the comparative analyses of bitcoin vs fiat money and stocks - traditional financial assets. Analyzing, systematizing and generalizing the scientific works of modern scholars and financial engineers, the authors of this article aspire to compare theory with practice of bitcoin use. Comparative analyses of bitcoin vs stock demonstrate their feeble semblance from the point of view of beneficiaries of a new emission, acceptance, functioning as a store of value and high transaction costs of trading, while such features as volatility, value growth potential and regulatory oversite were proven to be common only partially. At the same time, contrary to conventional wisdom, there was likeness discovered in their use as a unit of account and medium of exchange, which they both lacked. Any semblance between bitcoin and stocks was not found in their impact on the environment, riskiness, backing, and emission's entity. When comparing fiat currency with bitcoin, the authors counterposed them focusing on their essence, contrasting contemporary money that can't exist without the debt relations of bank bookkeeping, to a mere book entry on a virtual ledger. Partial semblance was detected in their functioning as a medium of exchange, though absence of status of a legal tender makes acceptance of bitcoin optional – in contrast to mandatory in case of cash. Against the background of accelerated growth of bitcoin market capitalization the issues raised in the article seem topical and highly debatable, necessitating future research.

Keywords: *bitcoin, cryprocurrency, stock, fiat money, comparative analyses.*

Tabl.: *1.* ***Bibl.:*** *23.*

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Амалян А. В., Бондаренко О. С. Таксономія біткоїну

Біткоїн – перша та найвідоміша децентралізована цифрова монета, яка започаткувала глобальну дискусію щодо її природи та відповідної категоризації. З моменту свого створення в 2009 році біткоїн не піддавався класифікації, демонструючи характеристики, що порушують межі між традиційними класами активів. Відсутність чіткої загальновизнаної категоризації має значні наслідки для регулювання, оподаткування, практики бухгалтерського обліку та глибшого розуміння ролі біткоїнів у фінансовому світі. У цій статті досліджено багатогранну природу біткоїну на основі його порівняльного аналізу з готівкою (фіатними грошима) та акціями (традиційними фінансовими активами). Метою цього порівняльного аналізу є виявлення подібності та відмінностей між згаданими категоріями. Аналізуючи, систематизуючи та узагальнюючи наукові праці сучасних учених і фінансистів, автори цієї статті прагнуть зіставити теорію з практикою використання біткоїнів. Порівняльний аналіз біткоїнів і акцій демонструє їх слабку схожість з точки зору бенефіціарів нової емісії, сприйняття населенням, функціонування у ролі

інструмента збереження вартості та транзакційних витрат під час їх використання, тоді як такі характеристики, такі як волатильність, потенціал зростання вартості та регулятивний нагляд, як було доведено, є спільними для них лише частково. Попри загальноприйняту думку, дослідження показало певну схожість у використанні біткоїнів і акцій як одиниці розрахунку та засобу обміну. Однак обидва активи значною мірою не виконують ці функції належним чином. Жодної подібності між біткоїнами та акціями не було виявлено з точки зору їхніх емітентів, а також у їхньому впливі на навколишнє середовище, ризикованості та забезпеченості. Порівнюючи фіатну валюту з біткоїнами, автори зосередилися на їхній суті, протиставляючи сучасні гроші, які не можуть існувати без боргових відносин у банківському бухобліку, біткоїну як простому запису у віртуальному реєстрі. Було виявлено часткову схожість у їхньому функціонуванні як засобу обміну, хоча відсутність статусу законного платіжного засобу робить прийом біткоїнів необов'язковим — на відміну від готівки. На фоні прискореного зростання капіталізації ринку біткоїнів питання, порушені в статті, видаються актуальними та вкрай дискусійними, що обумовлює потребу в подальших дослідженнях.

Ключові слова: *Bitcoin, криптовалюта, акція, фіатні гроші, порівняльний аналіз.*

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Since the pseudonymous Satoshi Nakamoto introduced bitcoin in 2008, fierce debate has arisen over the issue of what the bitcoin fundamentally is. What began as an effort to provide an alternative to central bank currencies by offering decentralized wallets and payment systems, has evolved into a complex hybrid instrument: something that behaves as both money and an investment asset. As a result of this dual identity, both economists and regulators as well as investors have interpreted the same underlying data in quite different ways, with bitcoin being called everything from "cryptocurrency" to "better gold than gold" to a "speculative bubble."

The **aim of this article** is to analyze whether bitcoin fits into the category of fiat currency or financial asset, breaking down its characteristics. Employing a methodical comparative framework, the research conterposes the issuance mechanism, regulatory supervision, volatility, and economic functionality of bitcoin with the same characteristics of financial assets and fiat currency. Using a mix of quantitative and qualitative analysis the authors quote and explore the concepts of the renowned scholars and investors, balancing them with the practice of bitcoin use. The whole article can be seen as a literature review of the latest publications on the issues of bitcoin in conjunction with the examination of the legislative guidance documents, issued by the regulators of monetary and financial markets in different countries. As a rule, each author or regulatory agency validates his or its own vision.

The novelty of the presented research is seen in the componential analyses of the discussed categories.

The first definition of bitcoin was suggested by its creator in 2008: in the groundbreaking 9-pages white paper titled "Bitcoin: A Peer-to-Peer Electronic Cash System" Satoshi Nakamoto (2008) defined bitcoin as "a purely peer-to-peer version of electronic cash" [1]. This mysterious and anonymous author of the first ever paper on bitcoin was not preoccupied with labeling, but focused on the problems of proof-of-work, network, incentives, payment verification, combining and splitting value, transaction processes, etc. Later on, on August 17, 2010, the article under the name of Satoshi Nakamoto asserted the author's opinion: "I think the most apt description of bitcoins is that they are shares of stock in this communal bitcoin enterprise we are undertaking. It is a lot like being part of a company (right now a very small company) and being paid in stock shares. There are a fixed number of bitcoins, as there are a fixed number of shares in a company (barring new issues/etc.)… In essence, bitcoins are like a "direct public offering" of stock in the bitcoin enterprise" [2].

On August 27, 2010, the same author posted the following statement: "Bitcoin have no dividend or potential future dividend, therefore not like a stock. More like a collectible or commodity" [2].

With the time going on scientific and business literature has been replenished with different and often almost completely incompatible interpretations of bitcoin: from a particular case of cryptocurrency (generic name), to 'better gold than gold' (Gavin Andresen), to 'cryptoasset' [3] and 'security' [4], to Robert Shiller's 'bubble' [5] and to Nassim Taleb's 'Cult coupled with a financial instrument' [6].

Commonly used definition 'cryptocurrency' or 'virtual currency' [7] are based on the assumption that bitcoin is a kind of 'currency', while for accounting purposes, bitcoin is often treated as an intangible asset,

which falls under the broader category of financial assets. At the same time the US Securities and Exchange Commission (SEC) is inclined to view cryptocurrencies as somewhat of securities, while the Commodity Futures Trading Commission (CFTC) treats them as commodities.

To examine the validity of such categorization we suggest to start with a comparative analysis of such properties as issuer and beneficiary of new emissions, its backing, regulatory oversight and control of the corresponding market, acceptance, volatility, risk of fraud, transaction costs and functions.

By the *first* classification criterion bitcoin looks more like a financial asset, if we liken issuance (mining) of new bitcoins to the purchase of stocks. But US Securities and Exchange Commission counters such categorization due to the lack of a central issuer and bitcoin's decentralized nature [8]. Up till now the US SEC has not provided a formal, legal definition of bitcoin**.** However, it has expressed its views on bitcoin and other cryptocurrencies in various statements and enforcement actions, while making clear that it still has a role in regulating bitcoin and the broader cryptocurrency market, especially when it comes to exchanges that may list cryptocurrency. By its latest regulation on October 22, 2024, the US SEC has granted "accelerated approval" to the New York Stock Exchange to list and trade options tied to three spot bitcoin exchange-traded funds [9]. Separately, CBOE Global also got approval to trade options on two spot bitcoin ETFs. Due to these decisions institutional investors and traders got an additional possibility to hedge their exposure to bitcoin.

Main difference in emission of fiat currency compared to bitcoin mining is debt character of money created both by governments and financial institutions: paper bills in essence are IOU (document acknowledging the debt), interconnecting debt and credit. That means that in its very essence fiat money is irreconcilable with bitcoin being the mere book entry on a virtual ledger.

By the ***second*** classification criterion – beneficiary of new emission – bitcoin has nothing in common with cash – the issuer of the fiat currency (central bank) is guaranteed with seigniorage.

Bitcoin resembles more FA with the main difference residing in the time of reference: while the price of stock is determined by the past performance of the company and its expected future earnings, the price of bitcoin depends on the growing number of transactions with it. In the context of limited number of bitcoins to be mined (21 million) and with the growing costs of mining given the rising demand bitcoin is considered by many to be able to at least preserve its price.

The less volume is emitted, the more valuable is both the banknote and the stock of a successful company. Contrary to them bitcoin, to have any value at all, needs a large number of people, (i) interested in trading, buying/selling goods and services with it and investing in it and (ii) engaged in mining – people deriving their compensation from both seigniorage (the market value of a bitcoin minus its mining costs) and transaction fees upon validation. A central attribute is that bitcoin depends on the existence of such miners for perpetuity.

By the *third* classification criterion bitcoin has nothing in common with both FC and FA, the former being a legal tender, fully backed by government regulation and public confidence, and the latter backed by past performance and current management of the business entity.

Bitcoin has no government backing – its value is determined solely by market demand and the utility of its underlying technology. The primary value of bitcoins at any given time is the hope that they will someday be worth more than they are now. For that to happen, the bitcoin enterprise as a whole needs to gain collective value [2].

The same mismatch refers to the *forth* criterion: while emission of cash is controlled by the central bank (in many countries – by agreement with the government of the country) and stock emission is regulated by the Charter of the company, mining of new bitcoins is absolutely decentralized, being controlled by a network governed by protocol. ***In essence, the «rule-makers» are the developers of bitcoin, who created the original protocol and the community of miners and developers who continue to maintain and improve it,*** ensuring its smooth functioning. Governments and regulatory bodies can impose regulations on cryptocurrency exchanges, taxation, and other aspects of the industry, but all of it as a rule don't directly alter the underlying blockchain protocols.

Particular regulatory environment for bitcoin varies from country to country and from time to time. At present some governments have embraced cryptocurrencies, while others have imposed strict regulations or outright bans. Whilst in January 2025 the Czech National Bank declared that its board had approved conducting an analysis to look at broadening its reserves portfolio to include other asset classes, without mentioning bitcoin, European Central Bank President Christine Lagarde reaffirmed there was no place for the cryptocurrency in European central banking: "I am confident that ... bitcoins won't enter the reserves of any of the central banks of the General Council" [10]. Poland's central bank stated that it was not considering investing in cryptocurren-

cies, "an asset class with very high risk". The Romanian central bank has also said it has no plans to include crypto in any way. Federal Reserve chair Jerome Powell explained at the end of 2024 that the U.S. central bank was not allowed to own bitcoin. At the same time El Salvador became the first country to recognize bitcoin as legal tender in June 2021.

By the *fifth* classification criterion (level of acceptance) cash, contrary to bitcoin, is a legal tender, which is accepted at its face value everywhere by everyone on the territory of a respective country.

Financial assets have to be bought by somebody willing to do it; the same refers to bitcoin, which need another party, interested in buying it or receiving it as a payment for goods or services. This condition is valid even in El Salvador, where David Argente and Diana Van Patten (Yale SOM) and Fernando Alvarez (University of Chicago) developed a survey, analyzing Salvadorans' use of bitcoin and Chivo Wallet – an app that provides the possibility to pay peers and firms and make deposits and withdrawals both in U.S. dollars and in bitcoin; that app offers numerous bonuses for its users, incuding $30 bitcoin bonus, a discount on gas when bought with the Chivo Wallet, and the elimination of certain transactional fees. As the results of the survey demonstrated, almost 20% of people who downloaded the app, hadn't used their bonus by the time of the survey and most people who spent their bonus didn't continue to use the app after doing so. Further, more than 20% of people surveyed knew about the app but did not try to download it [11].

By the *sixth* classification criterion – volatility – bitcoin has no equals, being infamous for its price volatility: Between its 2010 launch and early 2024, its price underwent four separate moments of dropping by half. In November 2021, it reached a (then) all-time high of $69,000; by the end of 2022, it had fallen below $20,000. In March of 2024, the price topped $73,000 a coin. And at the end of 2024, the price of a bitcoin surged past $100,000 for the first time, in anticipation of a favorable regulatory environment under new Trump administration [12]. Today, as of February 6, 2025, the price is USD 98 609 compared to USD105 403 seven days prior.

The Nobel prize laureate Robert Shiller is famous to declare that "the instability of bitcoin's value in dollars is a measure of failure, not success" [5].

It should be kept in mind, that the bitcoin market, like the securities market, is volatile since it represents the free market of demand and supply. Due to that, this kind of market is vulnerable to the internal and external factors of influence. The internal factors influencing bitcoin are in the majority of cases unknown, regarding the very nature of cryptocurrencies when compared with the securities of companies (which have the whole organizational structure behind them, working on increasing the value of the company). Thus, the nature of bitcoin, not backed by any business entity – just virtual currencies being bought, sold and held on the portfolio like gold, silver and other commodities – predetermines mainly the impact of external factors, the main of them being the interest of bitcoin market participants in trading. The latter meaning that without miners, traders using bitcoin and investors in it there will be no records in public ledgers. This has to be followed by the appropriate (zero) price.

By the *seventh* classification criterion – value growth potential – bitcoin is exact opposite of cash: as a rise of the price of money is the sign of deflation, which is more dangerous than inflation (decrease of the price of money), countries with a sound monetary policy regulate the potential growth by establishing limits to M_2. As a rule, value growth potential is low – up to 3%.

Value growth potential of a stock is determined by the performance of the corresponding business entity. But in no case the price of stock can fall to zero – any company, even going bankrupt, has some salvage value.

Uniqueness of bitcoin was readably explained by the well-known investor Marc Andreessen, who wrote that the value of bitcoin "is based directly on two things: use of the payment system today – volume and velocity of payments running through the ledger – and speculation on future use of the payment system... It's not as much that the bitcoin currency has some arbitrary value and then people are trading with it; it's more that people can trade with bitcoin … and as a result it has value" [13].

Thus, in case of bitcoin falling out of fashion, miners vanishing, technology becoming obsolete and future generations getting into other such «assets», as predicted by Nasim Taleb in 2021, the value of bitcoin as "a mere book entry on a virtual ledger that requires constant refreshing *ad infinitum*", will be zero… It is crucial that bitcoin is based on perfect immortality; unlike conventional assets, the slightest mortality rate puts its value at 0" [6].

Currently the price of bitcoin is driven by sentiment: "When the market shifts to its "greed" phase, bitcoin soars amid the utopian promises and speculators dismiss the risks of an asset that generates no cash flow. In the "fear" phase, bitcoin's price seems to find no traction, as sellers push its price lower amid bad news or general market malaise" [14].

Tracing transaction costs (*eighth* classification criterion) is interesting to start with the claim of the developers of bitcoin, who named 'reduced transaction costs' (due to the elimination of intermediaries) as one of the main advantages of their product. As it turned out, with bitcoin growing in popularity, it became "cumbersome, slow, and expensive to use" [15]. According to experts, nowadays transactions in bitcoin are considerably more expensive than wire services or other modes of transfers.

Average bitcoin transaction fees (measuring the average fee in U.S. Dollars when a bitcoin transaction is processed by a miner and confirmed) spikes during periods of congestion on the network, as they did during the 2017 Crypto boom where they reached nearly USD 60, and on April 20, 2024, when the fee exceeded USD 128,4; on February 3, 2025 this fee was only USD 1.564 per transaction [16].

Currently one can buy and sell bitcoin in ATM located in Kyiv, Dnipro, Kharkiv, Kryvyi Rih, Lviv, Odesa, Poltava, and Vinnytsia. To buy it the customer has to pay 8-9% fees (the exact level of fees varies daily) while selling is much cheaper – around 1%. Bid-ask spread as of February 3, 2025 was UAH 4.070,500 – UAH 4.471,600 [17].

Contrary to the claims of bitcoin founders, all cryptocurrencies require a whole set of intermediaries in the form of firms that provide processing and financial services, in many cases even involving the criticized banking system. Each middlemen charge its own commissions or fees.

Transactions in bitcoin are also order of magnitudes slower than standard commercial systems used by credit card companies – it takes about 10 minutes to validate most transactions using the cryptocurrency, while purchases with a cell phone can be made instantly.

Another serious drawback of bitcoin, that was not foreseen by its creators, but presented itself in the course of its global-wide use, is extremely high energy consumption. The proof of work method with an adjustable degree of difficulty based on the speed of blocks, in theory aims to encourage miners to keep operating the system. Such adjustments lead to an exponential increase in computer power requirements, making at the time of writing this article onerous energy and waste treatment demands on the environment [6].

Bitcoin network annualized power demand is estimated by Cambridge Bitcoin Electricity Consumption Index (CBECI) to be 182.86 TWh [18]. It means that the bitcoin network consumes as much energy as entire countries like Argentina, Ireland, Poland, or Norway, thus creating significant carbon footprint.

But the environmental cost of bitcoin mining is not limited to greenhouse gas emissions. Water consumption for the cooling systems of the servers used for mining, and indirect use while producing electricity via the cooling of thermoelectric power stations is estimated to be 1.5 billion liters of water in 2021 [19]. And this is supplemented by a huge amount of solid hazardous electronic waste from specialized hardware used for such mining operations that becomes obsolete roughly every 1.5 years while burning out rapidly: the average e-waste per transaction is estimated to be 347.3 grams [20].

Summarizing all the data, Andrew Lobo [21] concluded that as the price of bitcoin soars, so does the environmental cost of cryptocurrencies in general.

Comparing the abovementioned features of bitcoin with those of operations with cash and securities, we should mention almost negligible environmental footprint of the trading stocks or cash transactions. As to the costs, trading shares necessitates paying fees to brokers and depository, not to forget about bid-ask spread, while transactions with fiat currency are based on bank rates and currency exchange rates. In cross-border payments traditional banking payment infrastructure can be expensive and slow, while in local payments it is much less expensive and almost instantaneous nowadays. Both ways of payments abroad necessitate high currency conversion costs – whether two currencies are exchanged or bitcoins are bought in one and sold in another currency.

Risk of fraud – the *ninth* classification criterion – is inherent to almost everything. What differs stocks and cash from bitcoin is criminal responsibility for counterfeited financial instruments. We have already witnessed numerous cases of actualization of threats to bitcoin, including the following: cryptocurrency exchanges may fail; digital wallet providers may steal cryptocurrency; mixing "protocols are usually not public" which enables mixers, who disconnect originating and receiving addresses, to run away with funds; consumers and heirs-at-law may lose coins because of crashed/hacked computers of ancestors. Additionally, Böhme et al. (2015) stressed "legal and regulatory risk" [22].

What is more, the possibility of losses is installed in bitcoin protocol itself due to the 'risk of 51% attack' on the blockchain: an event, where a group controlling more than 50% of the hashing power of the network could block other users' transactions or reverse them and spend the same cryptocurrency again. An altered blockchain would be theoretically accepted by the network because the attackers would own most of it.

While considering the possibility of such an attack it would be applicable to mention that as of May 2024 [23], for example, the top two mining pools by three-day hashrate made almost 60% of the total bit-

coin network hashrate (FoundryUSA, making 30.9% and AntPool – 28.4%).

Both FA and FC aren't prone to such an attack.

Also it is worth mentioning that the decentralized nature of cryptocurrencies means there's no central authority to turn to in case of fraud. Scammers take advantage of this, using phishing schemes, Ponzi schemes, and fake initial coin offerings (ICOs) to deceive unsuspecting investors.

All of the above gives ground to agree with Sarah Gruber (2013, 162): "the bitcoin ecosystem is far less trustworthy than the banks that the bitcoin proponents denounce as untrustworthy."

By the last and to our mind, most important classification criterion, bitcoin is used predominately as an investment asset (speculative) while not functioning to its fullest as money.

Analyzing the possibility/expediency of bitcoin's ***functioning as a store of value*** it is more than advisable to recall its volatility and prediction of Nasim Taleb concerning final zero price of bitcoin. As demonstrated over the past years, bitcoin is worth only what buyers will pay for it. Speaking about ***the function of a unit of account*** (a yardstick, standardized measure of value for goods, services, assets, or debt within an economy) is senseless due to its significant price fluctuations. Especially hopeless seems bookkeeping of business entity, which has to trade (both as payer and payee) with vendors, partners and customers both in fiat currency and bitcoins.

The only function, that is more or less successfully performed by bitcoin, is a ***function of a medium of exchange.*** But even in this case, without the inscription "This note is legal tender for all debts, public and private" (as on a dollar bill) nobody is obliged to receive bitcoin as a means of payment.

Nikolas Taleb, one of the most zealous opponent of the use of bitcoin, points out to the difference between 'accepting bitcoin for payments' and 'pricing goods in bitcoin'. To 'price' in bitcoin, the price of any good or service must be fixed in bitcoin, with a conversion into fiat floating, rather than the reverse. Prices fixed in bitcoin with fluctuating prices in fiat currency inevitably will stimulate currency arbitrage, choosing the less expensive bargain. Such 'bimetallism' (coexistence of two currencies), according to Gresham's law (Bad money driving out good money), never lasted long.

To conclude this brief comparative analysis we suggest a statement of Nicolas Taleb (2021): "in its current version, in spite of the hype, bitcoin failed to satisfy the notion of «currency without government» (it proved to not even be a currency at all)", can be neither a short nor long term store of value (its expected value is no higher than zero), cannot operate as a reliable inflation hedge, and, worst of all, does not constitute, not even remotely, a safe haven for one's investments, a shield against government tyranny, or a tail protection vehicle for catastrophic episodes" [6].

A summary of our findings is presented in the *Table 1.*

Table 1

Overlapping of the attributes of bitcoin with Stock (Financial asset) and Cash (Fiat money)

	Classification criteria	Stock (financial asset)	Cash (Fiat money)
1	Issuer	Diverge	Diverge
2	Beneficiary of new emission	Match	Diverge
3	Backed by	Diverge	Diverge
4	Controlled / regulatory oversight	Partially, to a degree	Diverge
5	Acceptance	Yes	Diverge
6	Volatility	Partially, to a degree	Diverge
7	Value growth potential	Partially, to a degree	Diverge
8	Transaction costs Economic Environmental	 Match Diverge	 Match Diverge
9	Risk of fraud	Diverge	Diverge
10	Functions: store of value unit of account medium of exchange	 Yes Match as both lack it Match as both lack it	 Partially, to a degree Diverge Match – to a degree

Source: developed by the authors

CONCLUSIONS

Bitcoin's ambiguous status is reflected in its hybrid nature. Although it was designed as a decentralized digital currency, its extreme volatility, absence of government backing, and speculative-driven price fluctuations render it unsuitable for its intended purpose as a reliable medium of exchange. In comparison to fiat money, bitcoin is missing the support and stability necessary for it to share the role of a broadly adopted monetary unit.

By contrast, its behavior as an investment, especially in terms of price speculation, makes it much more resemble a financial asset – a high-risk asset at that – than conventional money.

Despite not being the currency that it was originally designed to be, bitcoin as a digital store of value has found a meaningful niche and audience to serve – to those not wanting their wealth to be held hostage by any bank. Yet its long-term sustainability is uncertain and reliant on technological innovations, regulatory action, and investors' sentiment changes.

Like commodities, such as gold, bitcoin has characteristics of scarcity (it is limited to 21 million) and the mining process. But while commodities have an industrial or a practical use, bitcoin's price is primarily driven by perception.

Given these considerations, bitcoin is best characterized as a speculative digital asset with monetary characteristics. It doesn't exactly fall under the definition of a currency, stock or a commodity, it forms a new class of financial instrument defined by technology, economics and regulation. Its long-term classification will just depend on how the institutions and markets and governments continue to adopt and regulate it. ■

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