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Can code become currency? Tracing the transition of cryptocurrency money-prospects research, 2011–2026

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Abstract

Purpose – This study traces how research on the money-prospects of cryptocurrencies has changed since the bibliometric baseline of Afzal and Bhatti (2021). It asks which themes continued, which faded, which emerged, and whether the literature's verdict on cryptocurrencies as money has moved with its themes. **Design/methodology/approach** – The study compares two Web of Science corpora under one eligibility screen: 165 baseline articles (2011–2021) and 324 update articles (2021–2026). A reproducible Python pipeline combines co-word networks with Louvain clustering, strategic diagrams, inclusion-index thematic evolution, a topic model of titles and abstracts, and a structured coding of each abstract for theme, perspective on money and conclusion. **Findings** –The object of study has changed sharply. Stablecoin and asset-backed tokens rise from 2.4% to 24.1% of studies, and Bitcoin-centred work falls from 45.5% to 20.1%. New themes form around stablecoins and monetary policy, CBDC and payments, crypto-asset regulation under MiCA, Sharīʿah treatment of digital assets, and currency competition. The verdict, however, has not moved: unsupportive conclusions hold at about 15% and outright supportive ones stay below 5% ($\chi^2 = 1.76$, $p = 0.63$). The question of whether code can become currency has been relocated to stablecoins and CBDCs, not resolved. **Originality/value** – This is the first update review that measures transition against a published baseline with an identical screen, and it releases its full pipeline for audit and re-use. For Islamic finance, it shows a growing Sharīʿah strand that has shifted from the permissibility of Bitcoin to zakat, tokenised assets and Sharīʿah-compliant stablecoins and CBDCs.

Keywords: Cryptocurrency; Money-prospects; Stablecoins; Central bank digital currency; Sharīʿah; Science mapping; Thematic evolution; Update review

Introduction

Over the centuries, money and its technology have remained adaptive to human needs and have been reshaped accordingly. From commodity money to coins, paper notes and bank deposits, the form of money has followed shifts in technology, and in its most recent turn it has transformed itself from atoms to digits. While the global financial crisis of 2007–2008 was taking its toll and trust in regulators and financial institutions was falling, a pseudonymous author calling himself Satoshi Nakamoto proposed Bitcoin as a peer-to-peer electronic cash system that works without a trusted third party (Nakamoto, 2008). The success of Bitcoin paved the way for thousands of

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other cryptocurrencies, and for a market that claims, in different degrees, the role of money (Boehme et al., 2015; Dwyer, 2015; Fernandez-Villaverde, 2018).

Whether cryptocurrencies can serve as money, in supplement or in replacement of fiat currencies, remains hotly debated and largely indecisive. A ray of studies maintains that cryptocurrencies behave like speculative assets and are unsuitable as money (Ammous, 2018; Baur et al., 2018; Polasik et al., 2016; Velde, 2013; Yermack, 2015). Others argue that they hold clear advantages over traditional currencies and may serve as money in a limited domain or in the future (Caton, 2020; Hazlett & Luther, 2020; Nelson, 2020; Schilling & Uhlig, 2019). Mainstream adoption as a generally accepted medium of exchange is still an unrealised dream, and the evidence favours speculative use over the purchase of goods and services (Ciaian et al., 2016a; Hairudin et al., 2020; Luther, 2016). The status of money-prospects is no more settled in the Sharīʿah literature. Some scholars recognise cryptocurrencies as wealth (*māl*) with the potential to become money if institutionalised, while others deny them even the status of a permissible asset (Assaf, 2019; Baker & Semai, 2020; Kirchner, 2021; Siswantoro et al., 2020).

Our earlier bibliometric review mapped the influential and intellectual structure of this literature across 264 Web of Science articles published during 2011–2021 (Afzal & Bhatti, 2021). It identified four clusters: the nature and volatility of cryptocurrencies, governance and price dynamics, social, ethical and legal aspects, and debates on the functions of money. It also found the Sharīʿah perspective marginally attempted, and the link between the functions and the ontology of money largely missing, with only one study marginally attempting it (Smit et al., 2016).

The field has changed in kind since that review closed, not merely in volume. The collapse of the algorithmic stablecoin TerraUSD in May 2022 showed how quickly a “stable” token can lose its peg (Briola et al., 2023; Gadzinski et al., 2024; Saengchote & Samphantharak, 2024). The failure of the FTX exchange later that year exposed the fragility of the centralised intermediaries through which most users hold cryptocurrencies (Freitas et al., 2025; Vidal-Tomás et al., 2023). El Salvador’s adoption of Bitcoin as legal tender in 2021 gave the medium-of-exchange function its first national test. A nationally representative survey of 1,800 households, combined with transaction data from the government’s Chivo wallet, found the use of Bitcoin for payments to be low and declining over time, with privacy and security concerns as key barriers (Alvarez et al., 2023). Later studies find that cross-border flows fell after the law and that transaction costs stand in the way of everyday legal-tender use (Goldbach & Nitsch, 2026; Kim et al., 2025).

Research has moved towards stablecoins and central bank digital currencies (CBDCs) as the forms of digital money most likely to perform monetary functions (Ante et al., 2023; Gorton & Zhang, 2023; Grobys et al., 2021; Lyons & Viswanath-Natraj, 2023). Regulators now classify these instruments separately. The European Union’s Markets in Crypto-Assets Regulation treats e-money tokens and asset-referenced tokens apart from other crypto-assets (Minto, 2024; Regulation (EU) 2023/1114, 2023; van der Linden & Shirazi, 2023), and the United States enacted federal stablecoin legislation in July 2025 (Acharya et al., 2026; Ferguson et al., 2026; GENIUS Act, 2025). Asset-pricing research, meanwhile, increasingly treats cryptocurrencies as a distinctive asset class with its own risk factors rather than as currencies (Liu & Tsyvinski, 2021; Liu et al., 2022).

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On the Sharīʿah frontier, the International Islamic Fiqh Academy of the OIC declined to issue a ruling on cryptocurrencies in 2019 and called for further research on whether they constitute wealth with recognised value (International Islamic Fiqh Academy, 2019). Recent Islamic finance reviews remain narrow in scope and report a scarcity of studies (Md Tahir et al., 2025), while empirical work that evaluates stablecoins against the objectives of Sharīʿah has only just begun (Izadin et al., 2025).

These shifts raise a question that a fresh review of 2021–2026 alone cannot answer: *how* has the literature moved from where it stood? Existing reviews after 2021 take a single window. They map stablecoin research (Ante et al., 2023; Mahrous et al., 2026), adoption (Gupta et al., 2025; Singh & Yadav, 2025; Sousa et al., 2022), regulation (AlQudah & Bariviera, 2026) or digital currency at large (Feng et al., 2026; Zeng et al., 2026), and they read the field as it stands at one point in time. None measures transition against a published baseline, and none checks whether a change in what researchers study has come with a change in what they conclude about money. A comparison of this kind also has a practical difficulty. Two corpora drawn with different inclusion rules will show differences that are artefacts of selection, and a mapping run in one software package with manual settings cannot be repeated exactly by another team.

This study, therefore, examines the transition of the money-prospects literature from the baseline of Afzal and Bhatti (2021) to 2026. It addresses three questions:

- **RQ1.** Which themes of the baseline period have continued, split, merged or faded, and which new themes have emerged since 2021?
- **RQ2.** Has the change in themes come with a change in the forms of digital money studied, the perspectives on money adopted and the evidence used?
- **RQ3.** Has the literature's verdict on the money-prospects of cryptocurrencies changed, in conventional and in Sharīʿah scholarship?

The main contribution of the study stems out of its distinctive focus on transition rather than on a snapshot of the field. First, it anchors the update in a published baseline and screens both periods with the same eligibility criteria, so that the change it reports is a change in the literature and not in the sample. Second, it treats the method itself as part of the contribution. The mapping is rebuilt in an open Python pipeline in which every parameter is fixed in one configuration file, every result is regenerated from the raw exports, and every analyst choice is tested in a sensitivity grid. Keyword networks are triangulated with a topic model of titles and abstracts and with a structured coding of each study's conclusion, so that the paper can report not only what the field studies but what it concludes. Third, it gives the Sharīʿah strand its own place in the comparison, which the baseline found marginally attempted, and shows how its questions have moved with the market.

The rest of the paper is organised as follows. Section 2 summarises the baseline and the conceptual lens. Section 3 sets out the design and justifies each methodological choice. Section 4 reports the descriptive profile, the thematic structure of both periods, their evolution, the topic model and the coding comparison. Section 5 discusses the findings and sets out a research agenda, and Section 6 concludes.

Online ISSN: 3006-8886
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Background: the baseline and the conceptual lens

The 2011–2021 baseline

Afzal and Bhatti (2021) selected 264 articles from the Web of Science Core Collection and analysed them through citation, co-citation and bibliographic coupling in VOSviewer. The first cluster addressed the nature of cryptocurrencies and their volatility, often against gold and fiat currencies (e.g., Baur et al., 2018; Dyhrberg, 2016; Shahzad et al., 2019). The second studied price formation, governance and market efficiency (e.g., Cheah & Fry, 2015; Ciaian et al., 2016b; De Filippi & Loveluck, 2016). The third examined social, ethical, legal and Sharīʿah aspects (e.g., Assaf, 2019; Dierksmeier & Seele, 2018; Nabilou, 2019), and the fourth gathered miscellaneous debates on the functions of money and monetary economics (e.g., Ammous, 2018; Dwyer, 2015; Smit et al., 2016). The review concluded that the ontology of money and the Sharīʿah perspective remain indecisive, ambiguous and needed more work. One of the baseline's most cited safe-haven studies has since been retracted (Shahzad et al., 2019), and it is removed from the comparison reported here.

Conceptual lens

Most economists define money by its functions: a medium of exchange, a unit of account and a store of value. The cryptocurrency literature has largely restricted itself to this functional definition (Ammous, 2018; Dwyer, 2015; Halaburda et al., 2022) and has given less attention to the process through which anything comes to perform those functions. We, therefore, read the literature through three perspectives on the ontology of money, summarised here only as a coding frame (Afzal, 2022).

The *commodity* perspective holds that money is what money does. Its functions are identity-constituting properties, while properties such as divisibility, durability and price stability help identify an instance of money (Luther, 2018; Mäki, 2021). The *social* perspective treats money as a social construction whose value rests on trust in a promisor and on a collectively recognised status function (Searle, 1995; Smit et al., 2016); in its chartalist form, the state is the most credible promisor and money is a creature of law (Wray, 2014). The *Sharīʿah* perspective gives no fixed definition and leaves money to prevailing custom (*ʿurf*). Jurists distinguish natural money (*thaman khilqī*: gold and silver) from customary money (*thaman ʿurfī*), and anything else becomes money when it is wealth with legal value (*māl mutaqawwam*) and acquires currency value (*thamaniyyah*) through social concurrence and common usage (Baker & Semai, 2020; Usmani, 2014). Jurists remain divided on whether state issuance is necessary or one route among several to that concurrence (Kirchner, 2021; Rosele et al., 2023). Section 3.4 turns these perspectives into the coding frame used in the comparison.

Method

Design

We design the study as an update review with a transition design. A conventional update review adds recent studies to an earlier corpus and synthesises the combined evidence. A transition design keeps the two periods apart and asks what changed between them (Cobo et al., 2011; Zupic

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& Čater, 2015). We prefer the second for two reasons. Readers of a field that moves as fast as this one are often less interested in its past than in the direction of its movement: which clusters are evolving, which are being absorbed, and which new ones are forming. A published baseline also gives the comparison a fixed reference point, so the update does not have to reconstruct the earlier field from memory or from a second, differently specified search. We organise the protocol along the assembling, arranging and assessing stages of SPAR-4-SLR (Paul et al., 2021), report selection in line with PRISMA 2020 (Page et al., 2021), and follow current guidance for science mapping (Donthu et al., 2021; Zupic & Čater, 2015).

The method also departs from the baseline in its analytical tools, by intention. Afzal and Bhatti (2021) used bibliographic coupling and co-citation in VOSviewer, which reveal the intellectual base of a field through its references. Transition, however, is a question about content: what studies are about and what they conclude. We therefore combine three layers that read content from different fields of the record. The first is a co-word map built from keywords, the second a topic model built from titles and abstracts, and the third a structured coding of each abstract. A shift that appears in all three layers is unlikely to be an artefact of any one of them.

Data sources and search

Both periods are drawn from the Web of Science Core Collection, the database of the baseline. Keeping one database is a deliberate choice: adding Scopus to the update alone would widen coverage in one period only, and part of any change would then come from the change in source. Period 1 consists of 264 records exported for the baseline review retrieved on 10 September 2021. For Period 2, we ran the following query in the Web of Science Advanced Search on 27 October 2026.

> TI=(bitcoin* OR ethereum OR crypto* OR “virtual currenc*” OR “digital currenc*” OR stablecoin* OR “stable coin*” OR CBDC* OR “central bank digital currenc*” OR “digital asset*”) AND TS=(Islam* OR sharia* OR shariah OR halal OR fatwa* OR fiqh OR “medium of exchange” OR fiat OR money OR “unit of account” OR “store of value” OR currency OR “legal tender”)

The query extends the baseline terms to stablecoins, CBDCs and digital assets, which were marginal before 2021, and adds Sharīʿah terms so that the Islamic finance literature is not undersampled. It returned 3,960 records. Limiting publication years to 2021–2026 left 2,610; limiting document types to articles, review articles and early-access documents left 2,206; limiting the Web of Science categories to those of the baseline (Economics, Business Finance, Business, Management, Law and Religion) left 1,409; and limiting the language to English left 1,367. The export contained 1,368 records, of which one was a duplicate. The year 2021 is included in both periods so that articles published after the baseline search are not lost; 21 records appear in both exports and are assigned to Period 1, so that the published baseline stays intact and no document is counted twice.

Eligibility and a common screen for both periods

A study is included if it is a peer-reviewed article or review and addresses, as a main or secondary aim, at least one function of money, the legal or Sharīʿah status of cryptocurrencies as mon-

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ey, or a property of cryptocurrencies (volatility, price formation, adoption, governance, design) explicitly linked to their money-prospects. Studies that treat cryptocurrencies only as trading or portfolio assets, CBDC studies without a link to cryptocurrencies, anti-money-laundering and crime studies without an analysis of monetary status, and tax or accounting studies without such an analysis are excluded. Retracted articles are excluded. Every record was checked against its Web of Science retraction flag, and every DOI against the Crossref record, which carries the retraction notices of publishers and of the Retraction Watch database; records without a DOI were matched on title where Crossref holds them.

The decisive step is to apply this screen to *both* periods. The baseline was built for mapping and kept market and portfolio studies that the update screen excludes. Comparing the published baseline with a screened update would make part of any shift an artefact: the volatility literature, for instance, would appear to shrink partly because it was screened out of one period only. We therefore screened the 263 non-retracted baseline records with the Period 2 criteria. Figure 1 shows the selection. Of 1,367 Period 2 records, 345 were included (324 after the overlap rule). Of 263 baseline records, 165 were included; 64 were excluded as market or portfolio studies, 13 for an AML or crime focus, 11 as CBDC-only studies, 6 as tax or accounting studies and 4 for other reasons. One baseline record (Shahzad et al., 2019) was removed as retracted. The final corpus holds 489 documents. To link the results to the published map, every analysis is also re-run on the full baseline of 263 records (Section 4.7).

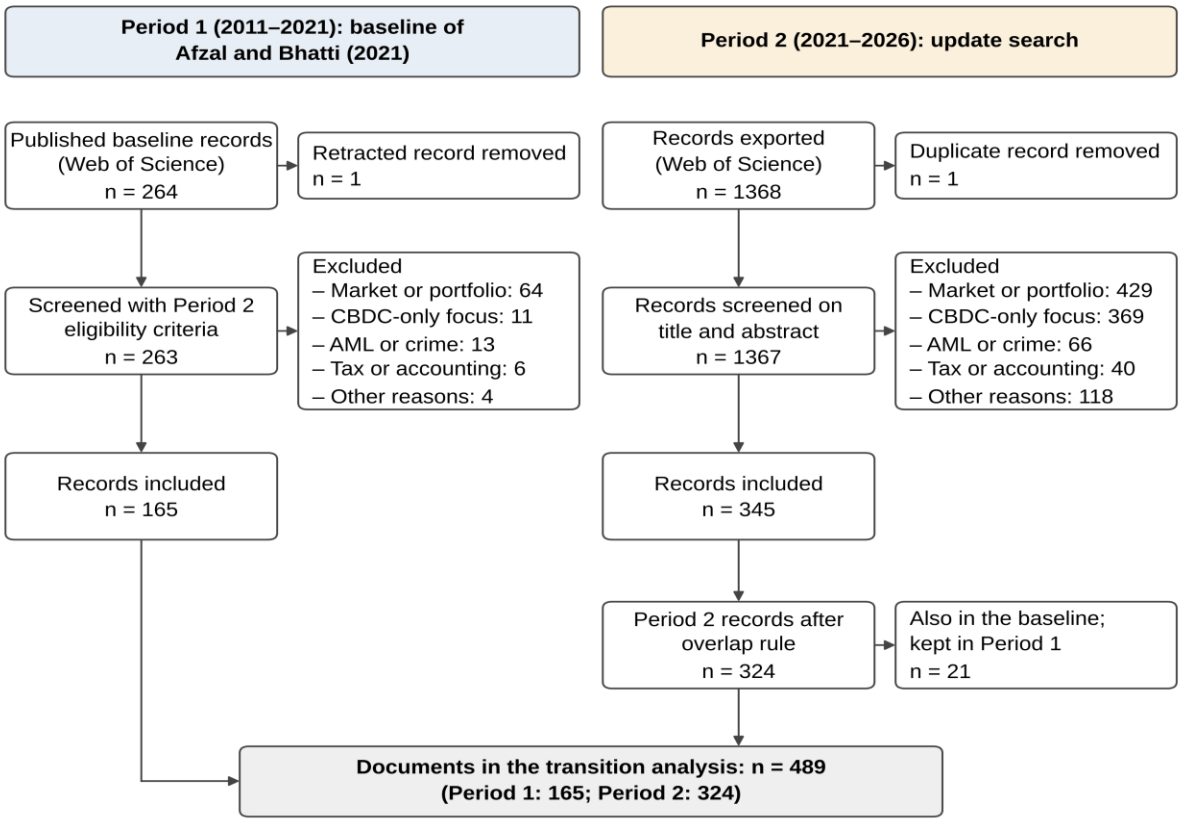


Figure 1. Selection of records in both periods (PRISMA 2020 style).

Online ISSN: 3006-8886
Print ISSN: 3006-8878

Coding frame

Each included study was coded from its title, abstract and keywords against the frame in Table 1, which turns the conceptual lens of Section 2.2 into categories. The six themes extend the four baseline clusters: volatility and asset nature, price formation and value, functions of money and economics, legal and regulatory status, Sharīʿah perspectives, and a new theme for stablecoins, CBDCs and tokenised money. The coding records the form of digital money studied, the function of money addressed, the perspective on money adopted explicitly or implicitly, the type of evidence, and the study's conclusion on money-prospects. A conclusion is coded as supportive when a study finds that a digital instrument performs, or can perform, the functions of money; as conditional when that finding depends on design, backing, regulation or context; as unsupportive when the study finds that it does not; and as not stated when the study draws no conclusion on the question. Abstracts are the unit of coding because they state each study's aim and conclusion in a comparable form and are available for almost every record (all but five). The same codebook was applied to both periods, and the authors reviewed every code.

Table 1. Coding frame

Dimension	Codes
Theme	Volatility and asset nature; price formation and value; functions of money and economics; legal and regulatory; Sharīʿah perspectives; stablecoins, CBDCs and tokenised money
Form of digital money	Bitcoin; cryptocurrencies in general; stablecoins and asset-backed tokens; CBDC; combinations
Function of money	Medium of exchange; unit of account; store of value; all three; not specified
Perspective on money	Commodity/functional; social/trust/state; Sharīʿah; mixed or ontological
Evidence type	Empirical quantitative; empirical qualitative; conceptual or theoretical; legal or juristic; review
Conclusion on money-prospects	Supportive; conditional; unsupportive; not stated

Science mapping

The co-word maps use the union of author keywords and Keywords Plus. Author keywords alone left too many baseline records without any keyword (Table 2), and Keywords Plus is assigned by the same Web of Science algorithm in both periods. Keywords are lower-cased, singularised, stripped of JEL codes and harmonised through one thesaurus (for example, "central bank digital currency" and "CBDCs" become "cbdc"). Terms that restate the search query, such as "cryptocurrency", "bitcoin" and "money", are removed from the networks, together with generic terms such as "model" and "evidence". Query terms occur in a third to more than half of the records of each period; left in the network, they act as hubs that pull unrelated themes into one cluster and hide the structure the analysis is meant to reveal. Their changing frequency is still reported (Table 3).

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A keyword enters a period's network if it occurs in at least 1% of that period's documents (minimum two). A fixed count would demand more salience from the smaller period: with 165 and 324 documents, the rule gives thresholds of two and four, the same relative bar. Co-occurrence is normalised with the equivalence index $e_{ij} = c_{ij}^2/(c_i\, c_j)$, where c_{ij} is the number of documents containing keywords *i* and *j* and c_i the number containing *i* (Callon et al., 1991).

Themes are detected with the Louvain algorithm (Blondel et al., 2008) at resolution 1.0 and a fixed seed; a community of more than 20 keywords is split once by the same algorithm, a rule applied identically to both periods. Each theme is placed on a strategic diagram by its centrality (ten times the sum of its external links) and density (one hundred times the sum of its internal links divided by its size), with quadrants split at the period medians (Callon et al., 1991; Cobo et al., 2011). Motor themes are central and well developed, basic themes central but less developed, niche themes developed but peripheral, and emerging or declining themes neither. Themes of the two periods are linked when their inclusion index, the share of the smaller theme's keywords found in the other, is at least 0.2 (Cobo et al., 2011). A baseline theme with one link is continuing, with two or more it is splitting, and with none it is fading; an update theme with no link is emerging.

Topic model

Keywords are chosen by authors and indexers and can lag behind the content of a field. As a check that does not depend on them, we fit a non-negative matrix factorisation topic model (Lee & Seung, 1999) to the titles and abstracts of both periods together, so that topics are defined once and compared across periods. Texts are weighted by TF-IDF[1] over unigrams (single words) and bigrams (two-word phrases), with query terms and standard stop words removed. We retain eight topics; solutions with seven to ten topics recover the same topics with a mean best-match cosine similarity of 0.92 to 0.97. The prevalence of a topic in a period is the mean share of that topic across the period's documents.

Coding comparison

Shares of each coding category are compared across periods with Pearson's χ^2 test and Cramér's V. Some tables have expected counts below five, so we also report a Monte Carlo permutation p-value based on 10,000 random reassignments of the period labels.

Robustness and reproducibility

Every analyst choice is varied in a sensitivity grid: keyword source (author keywords alone or with Keywords Plus), occurrence threshold (two, three or four documents) and Louvain resolution (0.8, 1.0, 1.2). The stability of clusters across resolutions is measured by normalised mutual information (Danon et al., 2005). All analyses are re-run on the full, unscreened baseline. The pipeline is written in Python. It reads the raw Web of Science exports, fixes every parameter in one configuration file and every random seed, and regenerates every table and figure in this paper with one command; two consecutive runs produce identical results. Table 2 lists the main choices and the reason for each.

[1] Term Frequency-Inverse Document Frequency

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Table 2. Analyst choices and their justification

Choice	Setting	Reason
Database	Web of Science Core Collection in both periods	Same source as the baseline; a change of database would confound the comparison
Screen	Period 2 eligibility criteria applied to both periods	Removes selection artefacts; full baseline re-run as robustness
Overlap	Records in both exports kept in Period 1	Keeps the published baseline intact; no double counting
Keyword source	Author keywords + Keywords Plus	Author keywords alone cover 59% of baseline records at the lowest threshold; the union covers 71%
Query and generic terms	Removed from networks	Prevents hub terms from merging unrelated themes
Occurrence threshold	≥ 1% of the period's documents (min. 2)	Same relative salience in periods of unequal size
Association	Equivalence index	Normalises co-occurrence for keyword frequency (Callon et al., 1991)
Clustering	Louvain, resolution 1.0, fixed seed; one split of communities > 20 keywords	Modularity-based, deterministic; same rule in both periods
Evolution link	Inclusion index ≥ 0.2	Standard threshold for thematic evolution (Cobo et al., 2011)
Topic model	NMF, eight topics, fitted on both periods together	Keyword-independent check; one topic space for both periods
Tests	χ^2, Cramér's V, permutation p	Valid with sparse cells

Results

Profile of the two periods

The update period is twice the size of the baseline in half the time. The 165 baseline studies were published over eleven years, most of them from 2018 onwards, while the 324 update studies appeared in just over five years, at 40 to 84 a year from 2022 onwards (Figure 2). The literature has also moved closer to mainstream finance and monetary economics. Baseline studies were spread thinly, and no journal published more than four of them. In the update period, *Finance Research Letters* (14 studies), the *Journal of International Money and Finance* (9) and the *International Review of Financial Analysis* (8) lead, and central bank and BIS economists appear among the authors (Aldasoro et al., 2024, 2025; Balutel et al., 2024a, 2024b). The geography is broader. The share of studies with a United States address halves from 36.4% to 18.5%, the United Kingdom rises from 7.9% to 15.1%, and authors from Malaysia (4.9%), the United Arab Emirates (3.4%) and Turkey (3.4%) enter the leading group. Islamic finance journals carry 15 update studies, against 3 in the baseline. The kind of evidence has changed as well: conceptual studies fall from 47.3% to 31.8% of the corpus, while quantitative and qualitative empirical studies rise from 23.6% to 35.5% and from 4.8% to 9.6% respectively (Table 4).

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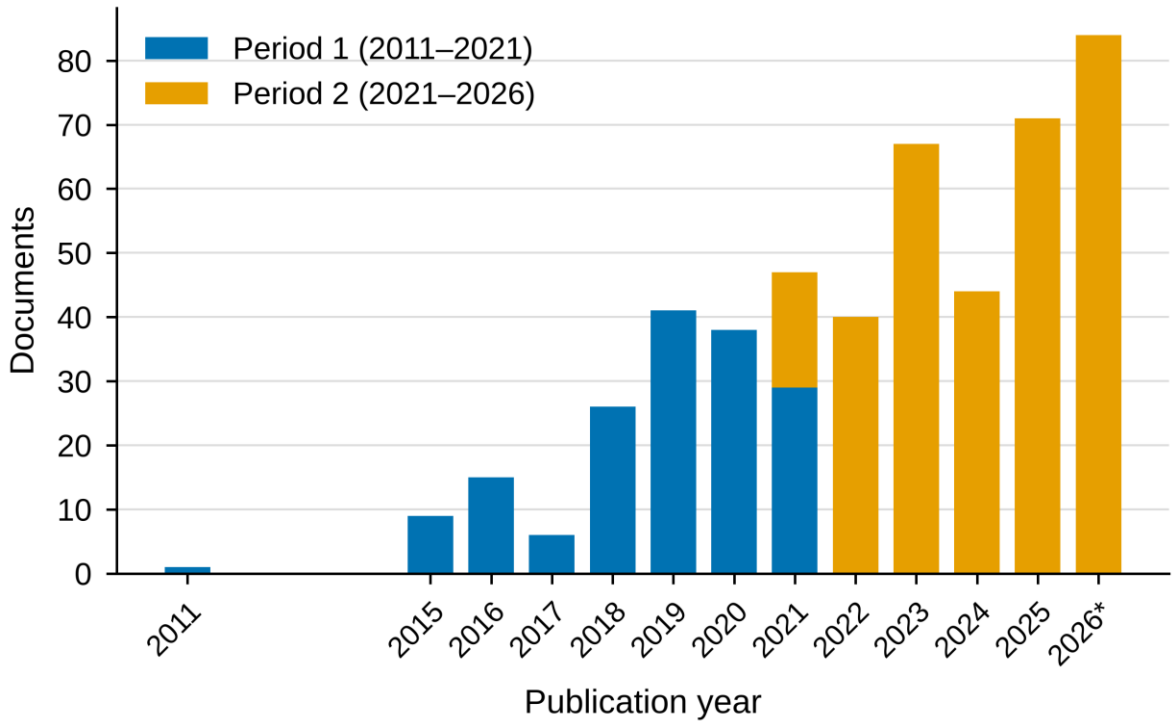


Figure 2. Annual number of studies in each period.

Table 3. Keywords with the largest change in share of documents

Keyword	Period 1 (%)	Period 2 (%)	Change (pp)
stablecoin	0.6	21.9	+21.3
cbdc	2.4	14.5	+12.1
crypto-asset	1.2	11.7	+10.5
monetary policy	1.8	5.6	+3.7
regulation	2.4	5.9	+3.4
financial stability	0.6	3.7	+3.1
defi	0.6	3.1	+2.5
digital asset	0.6	3.1	+2.5
digital currency	14.5	8.6	−5.9
virtual currency	9.1	1.9	−7.2
economics	10.3	1.9	−8.5
bitcoin	57.0	35.5	−21.5

Note. Share of each period's documents carrying the keyword after harmonisation (author keywords and Keywords Plus). Query terms are shown here but excluded from the networks.

Table 3 shows the keywords whose share changed most. "Stablecoin" appears in 0.6% of baseline studies and in 21.9% of update studies, "cbdc" rises from 2.4% to 14.5% and "crypto-asset" from 1.2% to 11.7%. "Monetary policy", "regulation", "financial stability", "defi" and "digital asset" all gain between two and four percentage points. "Bitcoin" falls from 57.0% to

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35.5%, and the early vocabulary of the field, “virtual currency” and “digital currency”, gives way to the regulatory vocabulary of “crypto-asset” and “token”.

Thematic structure of the baseline period

The baseline network holds 35 keywords and six mappable themes (modularity 0.835; Figure 3a). Its largest theme, *blockchain, trust and economy* (46 studies), sits in the emerging or declining quadrant. It gathers early work on the technology and governance of decentralised money: whether code can replace trust in institutions, how Bitcoin’s governance was in practice centralised, and what ethical questions a stateless currency raises (Boehme et al., 2015; De Filippi & Loveluck, 2016; Dierksmeier & Seele, 2018; Malherbe et al., 2019; Parkin, 2019; Weber, 2016).

Two basic themes carry the functional debate. *Gold, medium of exchange and safe haven* (13 studies) asks whether Bitcoin is used to buy goods or held as a speculative or safe-haven asset (Baur et al., 2018; Blau et al., 2021; de la Horra et al., 2019; Hazlett & Luther, 2020; Saiedi et al., 2021), and *volatility, GARCH and Bitcoin returns* (10 studies) measures how far price instability disqualifies it as a unit of account and store of value (Baur & Dimpfl, 2021; Ciaian et al., 2020; Dyhrberg, 2016; Hairudin et al., 2020). The motor theme of the period is the political economy of state response, *exchange, government and transaction policy* (10 studies). Models of currency competition in this theme ask whether governments can deter the use of Bitcoin by refusing it in their own transactions, and why network effects and switching costs protect incumbent currencies (Hendrickson & Luther, 2017; Hendrickson et al., 2016; Luther, 2016, 2019).

Two niche themes complete the map. *Monetary system, central bank and cash* (8 studies) considers what private digital currencies mean for monetary policy and for the case for central bank money (Belke & Beretta, 2020; Cukierman, 2020; Dow, 2019; Nabilou, 2020; Sauer, 2016), and *exchange rate, supply and demand* (4 studies) models Bitcoin’s price as that of a currency (Bolt & Van Oordt, 2020; Ciaian et al., 2016a, 2016b; Schilling & Uhlig, 2019). Small clusters on Sharīʿah, electronic money and technology acceptance are present but too small to map.

Thematic structure of the update period

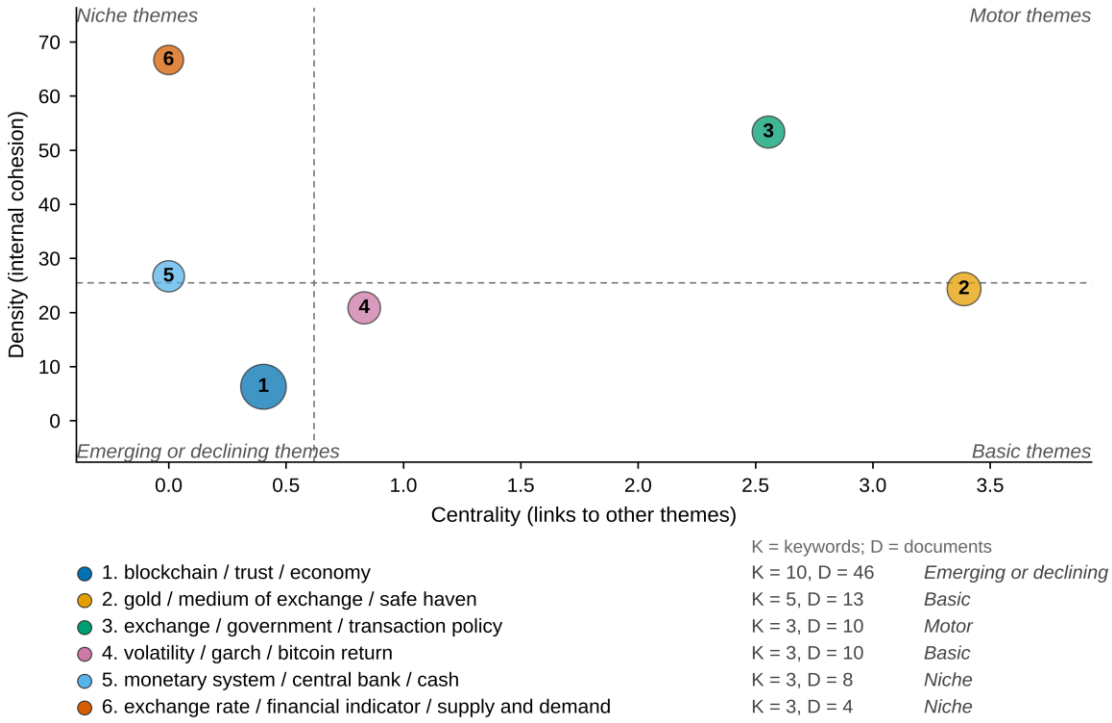
The update network is larger and denser (59 keywords, nine mappable themes, modularity 0.664; Figure 3b). Its centre has moved from Bitcoin to the institutions of digital money. Three basic themes now anchor the field. The largest, *stablecoins, monetary policy and financial stability* (98 studies), treats stablecoins as private money whose stability depends on reserves and redemption, and asks what they mean for dollarisation, bank deposits and monetary control (Baur & Hoang, 2021; Eichengreen et al., 2025; Gorton & Zhang, 2023; Hui et al., 2025; Li & Shen, 2021; Morgan, 2023; Murakami & Viswanath-Natraj, 2025). *Blockchain, distributed ledger technology and trust* (87 studies) continues the baseline’s technological theme but turns it to adoption, payment layers and the relationship between trust in code and trust in the state (Auer & Tercero-Lucas, 2022; Divakaruni & Zimmerman, 2023; Faria, 2022; Sousa et al., 2022; van der Linden & Shirazi, 2023). *CBDC, payment systems and fintech* (64 studies) places central bank money in competition with private digital money and asks how it changes the hierarchy of money (Allen et al., 2022; Arauz, 2021; Bespalova et al., 2025; Buckley, 2026; Cesaratto & Febrero, 2023; Zatti, 2022).

SOCIAL PRISM
Online ISSN: 3006-8886
Print ISSN: 3006-8878

Two motor themes drive the period. *Gold, volatility and safe haven* (63 studies) is no longer a portfolio question but a question of monetary quality: whether stablecoins hold their pegs, whether Bitcoin behaves like a fiat currency or like gold in stress, and whether it attracts demand when fiat currencies are in doubt (Abid et al., 2023; Alexakis et al., 2024; Grobys et al., 2021; Jalan et al., 2021; Jin et al., 2021; Zhang et al., 2023). *Crypto-assets, tokens and MiCA* (48 studies) carries the regulatory turn: the legal definition of crypto-assets, the separation of e-money and asset-referenced tokens, and their accounting treatment (Arnal, 2026; Hinojosa Martinez, 2021; Lener, 2022; Minto, 2024; Parrondo, 2023; Polasik et al., 2025).

Three niche themes are well developed but peripheral. *Digital assets, digital economy and Sharīʿah* (23 studies) gathers the Islamic finance literature on zakat, inheritance and the legal character of digital assets (Abd Wahab et al., 2023; Faizi, 2026; Habib, 2026; Muneeza et al., 2023; Rosele et al., 2023, 2025). Three niche themes are well developed but peripheral. *Digital assets, digital economy and Sharīʿah* (23 studies) gathers the Islamic finance literature on zakat, inheritance and the legal character of digital assets (Abd Wahab et al., 2023; Faizi, 2026; Habib, 2026; Muneeza et al., 2023; Rosele et al., 2023, 2025).

Liquidity, exchange and markets (19 studies) models the equilibrium between price, security and use (Gorton et al., 2026; Ma et al., 2026; Pagnotta, 2022; Palazzi et al., 2025; Yu, 2023). *Information technology, user acceptance and intention* (13 studies) measures the willingness of consumers, merchants and tourists to pay with cryptocurrencies (Bin-Nashwan et al., 2024; Dabbous et al., 2022; El Chaarani et al., 2024; Jegerson et al., 2025; Radic et al., 2022; Ronaghi, 2023).



SOCIAL PRISM
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Print ISSN: 3006-8878

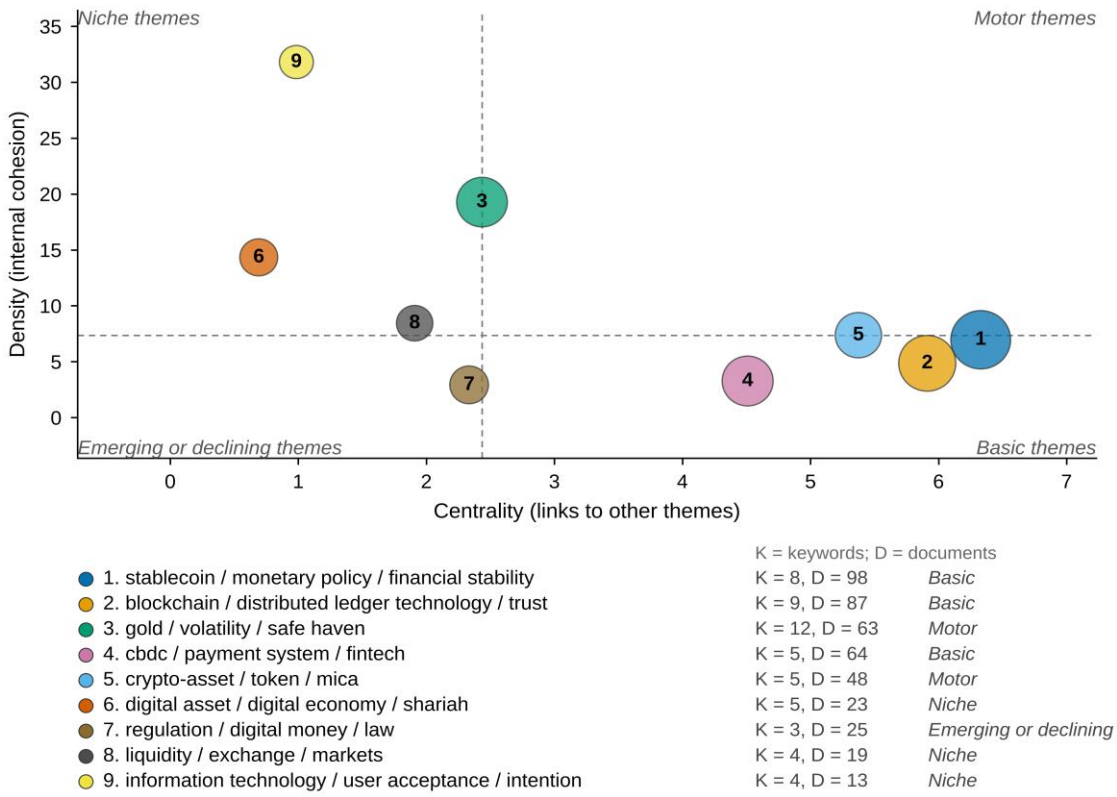


Figure 3. Strategic diagrams: (a) Period 1, 2011–2021; (b) Period 2, 2021–2026. Bubble area is proportional to the number of studies.

A small but well-connected theme, *regulation, digital money and law* (25 studies), sits in the emerging or declining quadrant; it links the failure of algorithmic stablecoins to the classification of digital money in law (Hao et al., 2026; Ivasenko et al., 2026; Milne, 2024; Saengchote & Samphantharak, 2024). A pair of keywords, *currency competition* and *Hayek*, marks a revived debate on private money that is too small to map but appears in no baseline network (Benigno, 2023; Benigno et al., 2022; Cengiz, 2025; Freitas et al., 2025; Mayer & Bofinger, 2024; Napari, 2026).

Thematic evolution

Figure 4 links the themes of the two periods. Five baseline themes continue. *Blockchain and trust* continues into its update counterpart (inclusion index 0.33). The two functional themes, *gold, medium of exchange and safe haven* (0.60) and *volatility and GARCH* (0.67), merge into the update's *gold, volatility and safe haven*. *Exchange, government and transaction policy* continues into *liquidity, exchange and markets* (0.33), and the small *Sharīʿah* and *technology acceptance* clusters grow into the update's Sharīʿah (0.50) and user acceptance (0.50) themes. One baseline theme splits: *monetary system, central bank and cash* feeds both *stablecoins, monetary policy and financial stability* (0.33) and *monetary system and financial system* (0.50). Three baseline themes fade: *exchange rate, supply and demand*, *electronic money and e-commerce*, and *acceptance and e-money*. Their questions have not disappeared but have been absorbed; the analogy with e-money, for instance, now runs through the e-money token category of MiCA.

SOCIAL PRISM
Online ISSN: 3006-8886
Print ISSN: 3006-8878

Four update themes have no baseline antecedent and emerge as new: *CBDC, payment systems and fintech*, *crypto-assets, tokens and MiCA*, *regulation, digital money and law*, and *currency competition and Hayek* (the CBDC result depends on the common screen; see Section 4.7). Together with the split of the central bank theme into the stablecoin theme, they describe the main line of transition: from the question of whether a decentralised cryptocurrency can become money, to the question of which designed and regulated form of digital money can, and who should issue it.

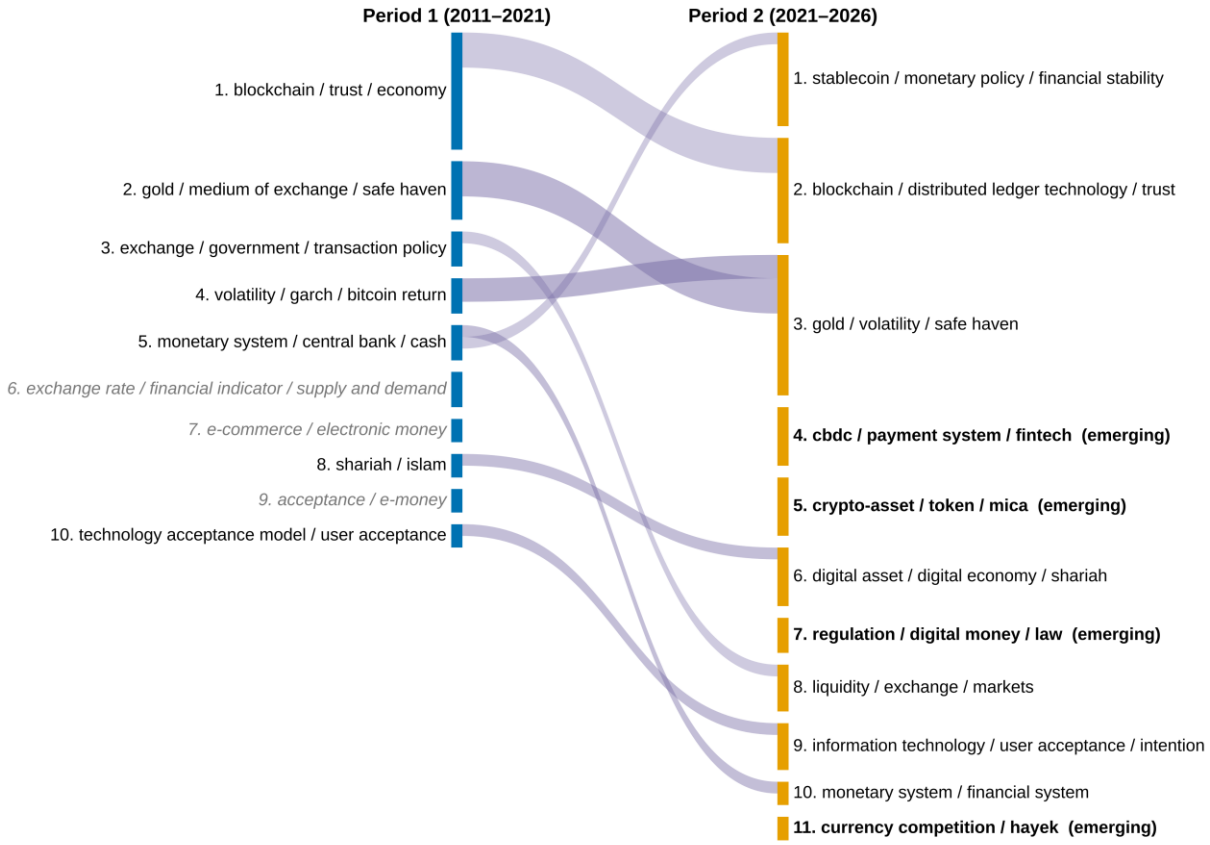


Figure 4. Thematic evolution between the periods. Links show inclusion index ≥ 0.2; link width is proportional to shared keywords. Grey italic labels mark fading themes; bold labels mark emerging themes.

Topic model

The topic model, which does not use keywords, confirms the shift (Figure 5). The stablecoin topic (stablecoins, stability, peg, algorithmic) grows from 2.1% to 16.2% of the corpus, the largest change of any topic. The CBDC topic grows from 9.6% to 12.4%, and the two Sharīʿah topics, one on Islamic finance and Sharīʿah scholarship and one on zakat, from 5.4% to 6.3% and from 2.3% to 4.7%. Topics on adoption, blockchain and trust (28.8% to 20.9%), price and volatility (21.2% to 15.2%), law and regulation (14.0% to 10.5%) and monetary policy and political economy (16.5% to 13.8%) lose share but remain large. The legal topic loses share in the topic model

Online ISSN: 3006-8886
Print ISSN: 3006-8878

even as legal keywords gain in the network, probably because legal work now concentrates on specific instruments, whose vocabulary the model assigns to the stablecoin and CBDC topics.

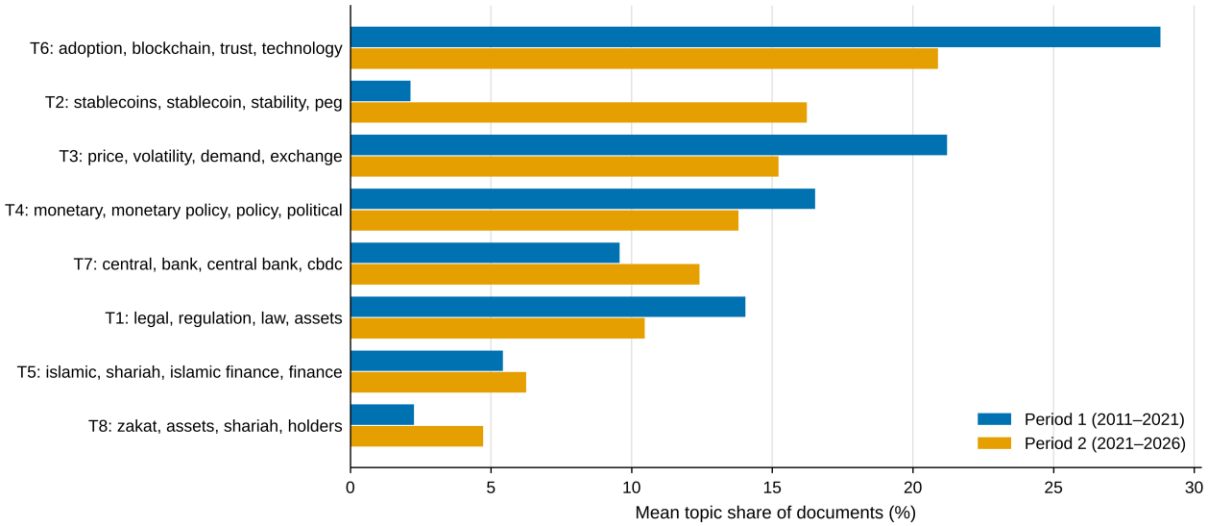


Figure 5. Topic prevalence by period (NMF on titles and abstracts; mean share of documents).

What the studies conclude

Table 4 and Figure 6 compare the coding of the two periods. Four dimensions change significantly. The theme mix shifts towards stablecoins, CBDCs and tokenised money, which rise from 6.7% to 29.0% of studies, while functions-of-money studies fall from 61.2% to 39.2% (χ^2 = 40.18, $p < 0.001$, V = 0.29). The form of digital money studied shifts most of all: Bitcoin-centred studies fall from 45.5% to 20.1%, and stablecoins and asset-backed tokens rise from 2.4% to 24.1% (V = 0.36). Studies that assess all three functions together fall from 49.1% to 29.0%, while those focused on the store-of-value function rise from 7.3% to 19.8% (V = 0.25). The commodity/functional perspective gains (26.7% to 34.3%) and the Sharīʿah perspective gains (5.5% to 9.0%), while the social perspective remains the most common (55.8% to 50.6%; V = 0.16, p = 0.016).

The conclusion on money-prospects does not change (χ^2 = 1.76, p = 0.63; permutation p = 0.63; V = 0.06). Unsupportive conclusions hold at 14.5% and 14.8%, supportive ones at 4.8% and 3.4%, and about half the studies in each period draw no conclusion on the question. Among studies that do conclude, the conditional verdict dominates in both periods and grows slightly, from 56% to 62%. The verdict is also stable within perspectives (Table 4, lower panel). Among Sharīʿah studies with a conclusion, 4 of 7 are conditional in the baseline and 14 of 19 in the update. Only one study in each period reaches a supportive view (Kirchner, 2021; Rifath et al., 2026), and unsupportive studies argue that cryptocurrencies lack intrinsic value and stability and fail the parameters of currency in Islamic law (Assaf, 2019; Hammad, 2022; Hassan et al., 2025; Khan, 2023; Siswantoro et al., 2020).

SOCIAL PRISM
Online ISSN: 3006-8886
Print ISSN: 3006-8878

Table 4. Coding of included studies by period (% of the period's studies)

Dimension and category	Period 1 (n = 165)	Period 2 (n = 324)	Change (pp)
Theme **($\chi^2 = 40.18$, $p < 0.001$, $V = 0.29$)**			
Functions of money and economics	61.2	39.2	−22.0
Stablecoins, CBDCs and tokenised money	6.7	29.0	+22.3
Legal and regulatory	17.6	17.9	+0.3
Sharīʿah perspectives	6.1	9.0	+2.9
Price formation and value	4.2	2.5	−1.8
Volatility and asset nature	4.2	2.5	−1.8
Form of digital money **($\chi^2 = 64.50$, $p < 0.001$, $V = 0.36$)**			
Bitcoin	45.5	20.1	−25.4
Cryptocurrencies in general	46.1	45.1	−1.0
Stablecoins and asset-backed tokens	2.4	24.1	+21.6
Cryptocurrencies and CBDC	6.1	5.2	−0.8
Stablecoins and CBDC	0.0	4.3	+4.3
CBDC	0.0	1.2	+1.2
Function of money **($\chi^2 = 31.20$, $p < 0.001$, $V = 0.25$)**			
All three functions	49.1	29.0	−20.1
Medium of exchange	26.7	21.9	−4.8
Store of value	7.3	19.8	+12.5
Unit of account or two functions	1.2	2.2	+0.9
Not specified	15.8	27.2	+11.4
Perspective on money **($\chi^2 = 12.17$, $p = 0.016$, $V = 0.16$)**			
Social/trust/state	55.8	50.6	−5.1
Commodity/functional	26.7	34.3	+7.6
Sharīʿah	5.5	9.0	+3.5
Mixed or ontological	2.4	2.8	+0.4
Not applicable	9.7	3.4	−6.3
Evidence type **($\chi^2 = 15.73$, $p = 0.003$, $V = 0.18$)**			
Conceptual or theoretical	47.3	31.8	−15.5
Empirical quantitative	23.6	35.5	+11.9
Legal or juristic	20.0	17.6	−2.4
Empirical qualitative	4.8	9.6	+4.7
Review	4.2	5.6	+1.3
Conclusion on money-prospects **($\chi^2 = 1.76$, $p = 0.63$, $V = 0.06$)**			
Supportive	4.8	3.4	−1.5
Conditional	24.8	29.6	+4.8
Unsupportive	14.5	14.8	+0.3
Not stated	55.8	52.2	−3.6
Conclusions by perspective (counts: supportive /			

SOCIAL PRISM
Online ISSN: 3006-8886
Print ISSN: 3006-8878

Dimension and category	Period 1 (n = 165)	Period 2 (n = 324)	Change (pp)
conditional / unsupportive)			
Commodity/functional	4 / 17 / 10	5 / 43 / 19	
Social/trust/state	3 / 18 / 11	5 / 37 / 22	
Sharīʿah	1 / 4 / 2	1 / 14 / 4	

Note. χ^2 tests use the full category sets; permutation p-values (10,000 draws) lead to the same conclusions as the asymptotic p-values (perspective: 0.014; all others unchanged in significance). pp = percentage points.

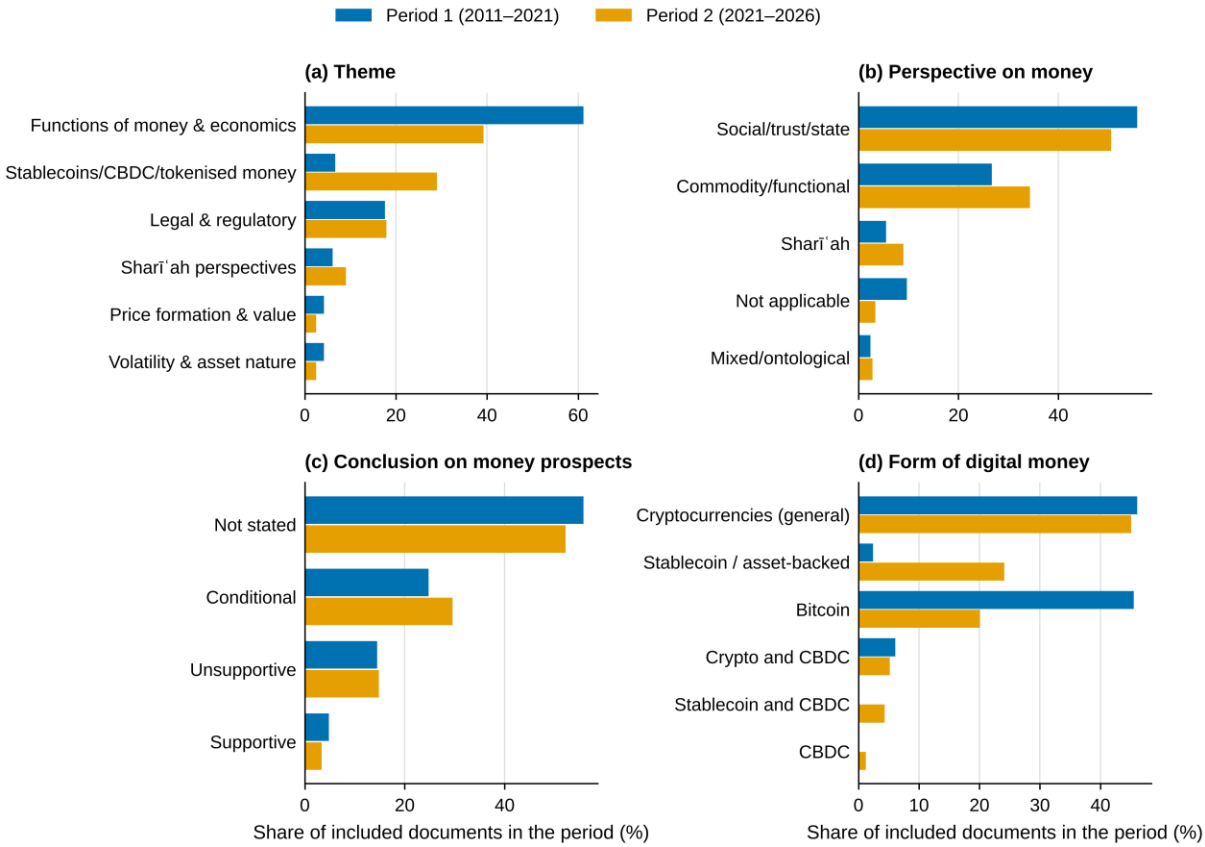


Figure 6. Coding of included studies by period: (a) theme; (b) perspective on money; (c) conclusion on money-prospects; (d) form of digital money.

Robustness

The main results hold across the sensitivity grid. At the chosen settings, the baseline clusters are identical across Louvain resolutions (normalised mutual information 1.00), and the update clusters change little (0.96 at resolution 0.8, 0.89 at 1.2); across the grid with Keywords Plus, the minimum is 0.86. Re-running the analysis on the full, unscreened baseline changes the size of one shift but not its direction. With market and portfolio studies left in, the price-and-volatility topic falls from 31.0% to 15.2% rather than from 21.2% to 15.2%, so nearly two-thirds of the

Online ISSN: 3006-8886
Print ISSN: 3006-8878

apparent decline of volatility research in a naïve comparison would come from screening alone. The stablecoin topic rises from 1.7% to 16.3% on the full baseline and from 2.1% to 16.2% on the screened one, so the rise of stablecoins does not depend on the screen.

One result does. The full baseline contains a CBDC cluster built from CBDC-only studies, which the screen excludes; on the full baseline, the update's CBDC theme therefore continues from that cluster rather than emerging, and the baseline CBDC cluster splits three ways, into the stablecoin, CBDC and monetary system themes. The full baseline also contains market-oriented clusters (market efficiency; connectedness and spillovers; money laundering and cybercrime). Market efficiency splits into the update's volatility and liquidity themes, connectedness merges into volatility, and money laundering splits into the blockchain-and-trust and the regulation themes. The *crypto-assets, tokens and MiCA* and *Sharīʿah* themes emerge or grow under both baselines.

Discussion

From coin to institution: what has changed

The clearest result of the comparison is a change in the object of study. In the baseline period, the money question was asked of Bitcoin and of cryptocurrencies as a class, and the debate turned on whether a decentralised, fixed-supply coin could earn acceptance without an issuer (Ammous, 2018; Baur et al., 2018; Cachanosky, 2019; Luther, 2016). Since 2021, the question has been asked of designed instruments: stablecoins that promise redemption at par against reserves, CBDCs that put central bank money in digital form, and tokenised deposits that put bank money on a ledger (Aldasoro et al., 2024; Buckley, 2026; Cesaratto & Febrero, 2023; Gorton & Zhang, 2023). The literature now discusses these instruments in the language of banking history, comparing stablecoins with private banknotes, free banking and money market funds (Calomiris, 2021; Gorton & Zhang, 2023; Mizrach, 2025; Oefele et al., 2024; Petratos & Baugus, 2025), and asks what reserves, redemption rights, capital and supervision they need to hold their value (Goel et al., 2026; Hao et al., 2026; Karakosta & Kyriazis, 2025; Karamti & Bouabid, 2026; Mullins, 2026).

This shift gives a qualified answer to the question in our title. In the update literature, code does not become currency on its own; it comes closest to currency when it is wrapped in the institutions that make conventional money trusted, namely an identifiable issuer, a reserve, a legal claim and a supervisor. Read through the conceptual lens, this is a move towards the social perspective on money, in which value rests on a credible promise (Phillips, 2025; Rivera, 2023; Searle, 1995; Wray, 2014). The rise of the commodity/functional perspective in Table 4 does not contradict this. It reflects the many stablecoin studies that measure a functional property, the stability of the peg, of an instrument whose stability depends on its backing (d'Avernas et al., 2026; Grobys et al., 2021; Karlina et al., 2026; Morin et al., 2026; Park, 2026).

The change also explains why the store-of-value function has displaced the medium-of-exchange function as the focus of research. Evidence on payments has hardened against cryptocurrencies. El Salvador's legal-tender experiment produced little payment use (Alvarez et al., 2023; Bibi, 2023; Goldbach & Nitsch, 2026; Kim et al., 2025), and surveys in Canada, the United States, Brazil and Japan find ownership far ahead of use in payments (Balutel et al., 2024a; Fujiki, 2024; Kowalski et al., 2023; Trebat, 2023). Where cryptocurrencies behave most like money is as a

Online ISSN: 3006-8886
Print ISSN: 3006-8878

refuge in economies with high inflation, capital controls or sanctions (Alexakis et al., 2024; Bas et al., 2023; Jallad & Tina, 2026; Kliber & Swierczynska, 2023; Marthinsen & Gordon, 2022; Ronaghi, 2023). In these settings the instrument of choice is often a dollar stablecoin, so the money that crypto delivers is frequently the dollar in token form, a form of digital dollarisation with its own costs for monetary sovereignty (Arauz, 2021; Coburger, 2025; Fantacci & Gobbi, 2024; Garita et al., 2024; Li & Shen, 2021; Murakami & Viswanath-Natraj, 2025).

Why the verdict has not moved

The stability of conclusions across a period of rapid thematic change needs explanation. Three features of the literature account for it. First, about half the studies in both periods draw no conclusion on money-prospects. Much of the field describes, models or classifies, and the share of empirical work has grown more than the share of evaluative work. Second, the dominant verdict is conditional, and the conditions have moved with the object. Baseline studies made money-prospects conditional on adoption, price stability or a better supply rule (England & Fratrik, 2018; Iwamura et al., 2019; Mainelli et al., 2019; Schilling & Uhlig, 2019); update studies make it conditional on reserve quality, regulation and legal-tender status (Karakosta & Kyriazis, 2025; Olk & Miebs, 2025; Polasik et al., 2025; van der Linden & Shirazi, 2023).

A literature can change its subject matter and keep the same verdict if each new instrument is judged, in turn, to be money only under conditions not yet met. Third, the unsupportive minority rests on arguments that do not depend on the instrument. Credit and state theories of money hold that a token without an issuer's liability cannot be money however it is designed (Marquez, 2025; Milne, 2024; Phillips, 2025; Rivera, 2023), and Sharīʿah studies that deny *thamaniyyah* rest on the absence of intrinsic value and of social concurrence (Hammad, 2022; Hassan et al., 2025; Khan, 2023).

These features point to a gap. After fifteen years of research, the field has few studies that test, rather than assume, the conditions under which a digital instrument becomes money. The conditions are named in many studies and examined in few.

The Sharīʿah strand

The Sharīʿah literature has grown faster than the corpus. Its share of studies rises from 6.1% to 9.0%, Islamic finance journals carry five times as many studies, and Malaysia, the United Arab Emirates and Turkey enter the leading contributors. Its questions have also changed. The baseline asked whether Bitcoin can be currency in Islamic law and answered through *ʿillah* and *maqāṣid* reasoning, with the jurists divided (Assaf, 2019; Baker & Semai, 2020; Hassan et al., 2020; Kirchner, 2021; Siswantoro et al., 2020).

The update literature moves to applied questions that assume crypto-assets are held by Muslims and must be treated: zakat on crypto-assets (Bin-Nashwan et al., 2024, 2025; Muneeza et al., 2023; Rosele et al., 2023, 2025), inheritance and estate planning (Abd Wahab et al., 2023, 2024), tokenised sukuk (Khan et al., 2022), gold-backed and Islamic crypto-assets (Ajouz et al., 2022; Nugroho, 2023; Wasiuzzaman et al., 2023; Wiwoho et al., 2024; Zaman et al., 2023), and the design of a Sharīʿah-compliant CBDC (Faizi, 2026). Juristic work is becoming more systematic, with fiqh taxonomies of *māl* and *naqd* and validated evaluation frameworks (Bekiroglu et al.,

Online ISSN: 3006-8886
Print ISSN: 3006-8878

2025; Habib, 2026; Muhammad et al., 2024; Sahalan & Samsudin, 2023), and *maqāṣid* analysis is being applied to stablecoins (Izadin et al., 2025; Rifath et al., 2026).

The Sharīʿah strand has not yet followed the conventional literature to its new centre. The International Islamic Fiqh Academy's call for research on whether cryptocurrencies are wealth with recognised value (International Islamic Fiqh Academy, 2019) remains largely unanswered for the instruments that now dominate the field. Stablecoins raise questions that the Bitcoin debate did not. A fiat-backed stablecoin is a claim on an issuer, so the analysis of currency exchange (*ṣarf*) and debt applies. Its reserves are held largely in interest-bearing short-term government and commercial paper, whose income accrues to the issuer (Acharya et al., 2026; Barthelemy et al., 2026; Liang, 2026). Algorithmic designs add *gharar* through their dependence on market confidence (Gadzinski et al., 2024; Saengchote & Samphantharak, 2024). A CBDC, on the other hand, may meet the condition of state recognition that several jurists consider sufficient for *thamaniyyah* (Faizi, 2026; Rosele et al., 2023). Each of these questions is open.

Methodological implications

Two methodological lessons follow. First, update reviews should screen both periods with the same criteria. In our data, a naïve comparison of the published baseline with a screened update would have attributed nearly two-thirds of the decline in volatility research to the field, when it came from the change of sample (Section 4.7), and it would have shown CBDC research as continuing rather than emerging as a cryptocurrency-linked theme. Second, mapping results are more credible when they can be regenerated and when their sensitivity is reported. The pipeline released with this paper fixes every parameter, reports how clusters respond to each choice, and allows the comparison to be extended when the next update is due, by adding a third period and re-running one command. Combining keyword networks, topic models and content coding also allowed the paper to separate what the field studies from what it concludes, which co-citation and coupling maps cannot do.

Research agenda

Table 5 organises the agenda by theory, context, characteristics and methodology (Paul & Rosado-Serrano, 2019; Singh & Yadav, 2025).

Table 5. Research agenda (TCCM)

Dimension	Questions for future research
Theory	Under which institutional conditions (issuer, reserve, legal claim, supervision) does a digital instrument acquire the functions of money? Can the commodity, social and Sharīʿah perspectives be combined into testable propositions? Does *thamaniyyah* by custom (*ʿurf*) extend to fiat-backed stablecoins, which are claims on an issuer?
Context	High-inflation, sanctioned and remittance-dependent economies; OIC member states with Islamic banking sectors; jurisdictions after MiCA and United States stablecoin legislation; CBDC pilots in Muslim-majority countries
Characteristics	Reserve composition and income (interest-bearing assets and *ribā*); redemption rights and runs; algorithmic versus collateralised designs (*gharar*); in-

Online ISSN: 3006-8886
Print ISSN: 3006-8878

Dimension	Questions for future research
	teroperability of CBDCs and stablecoins; zakat and inheritance treatment of tokenised assets
Methodology	Transaction-level and on-chain payment data instead of prices; natural experiments around legal-tender laws and regulation; mixed-method fatwa and Sharīʿah board studies; reproducible, multi-period science mapping that extends this paper's pipeline

Three priorities stand out. The first is to test the conditions under which a digital instrument performs the functions of money, especially reserve composition, redemption rights and legal-tender status, using transaction data rather than prices (Kim et al., 2026; Mizrach, 2025; Polasik et al., 2025). The second is a Sharīʿah assessment of stablecoins and CBDCs comparable in depth to the assessment of Bitcoin, covering ṣarf, debt, reserve income and gharar. The third is to study the economies where digital money is used as money, mainly those with high inflation, sanctions or weak banking, where evidence remains thin and largely survey-based (Coburger, 2025; Jallad & Tina, 2026; Kliber & Swierczynska, 2023; Rosales, 2026).

Conclusion

This study traced the transition of the money-prospects literature on cryptocurrencies from the bibliometric baseline of Afzal and Bhatti (2021) to 2026. Under one eligibility screen and one reproducible pipeline, three layers of analysis tell the same story. The field has moved its centre from Bitcoin to stablecoins, CBDCs and the regulation of crypto-assets; new themes have formed around monetary policy, payment systems, MiCA, Sharīʿah treatment of digital assets and currency competition; and the debate on the functions of money has narrowed from all three functions to the store-of-value function and the stability of pegs. The verdict, however, has not moved. About one study in seven concludes against crypto as money in both periods, outright support remains rare, and the conditional verdict dominates. The question of whether code can become currency has been relocated to designed and regulated instruments rather than resolved.

The findings carry implications for three audiences. For regulators and central banks, the literature's shift to stablecoins and CBDCs confirms that the policy question is no longer whether to recognise decentralised cryptocurrencies as money, but how to regulate private digital money that promises par value and how to position public digital money against it. For Sharīʿah boards and standard-setting bodies, the applied literature on zakat, inheritance and tokenised sukuk offers material for guidance, while the status of stablecoins and CBDCs calls for a fresh juristic assessment. For Islamic financial institutions, the growth of tokenised and asset-backed instruments opens product questions whose Sharīʿah basis has not yet been settled.

The study has limitations. It relies on one database and on English-language articles, so Arabic, Malay and Indonesian Sharīʿah scholarship and the Scopus-only Islamic finance journals are under-represented. The update query includes terms for stablecoins, CBDCs and Sharīʿah that the baseline did not use; the common screen limits, but cannot remove, the effect of this difference. The coding rests on titles and abstracts and on the authors' judgement, without an independent second coder. Keyword maps depend on the indexing practices of the database, which the topic model only partly offsets. Finally, the last year of the update is incomplete.

Future work can address these limits by adding Scopus and non-English sources, coding full texts and extending the pipeline to a third period.

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