

A Four-Dimensional Analysis of Cryptocurrency Licensing Regime Evolution in the US, EU, and China (2020-2025)

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Abstract

Between 2020 and 2025, systemic risk events such as the FTX collapse and Terra/Luna crisis accelerated cryptocurrency regulatory legislation across jurisdictions, with licensing regimes emerging as the core regulatory instrument, yet existing research broadly discusses regulatory policies without focused attention on licensing regimes and neglects the dynamic dimension of institutional evolution. This study examines the United States, European Union, and China as research subjects, adopting a multi-jurisdictional descriptive approach to construct a four-dimensional analytical framework comprising regulatory authorities, market access thresholds, ongoing obligations, and enforcement mechanisms, tracing the evolutionary trajectories of licensing regimes in each jurisdiction based on primary legal texts from public legal databases. The findings reveal that the United States exhibits a "fragmentation toward incremental consolidation" pathway, the European Union achieved a "fragmentation toward unified framework" transformation, and China completed a unidirectional intensification of "restriction toward comprehensive prohibition," with each jurisdiction's pathway reflecting its own regulatory priorities and institutional context. The contribution of this study lies in providing a methodological reference for multi-jurisdictional fintech regulatory research through the four-dimensional framework, while offering pathway references for regulatory institutional design in emerging market economies.

Keywords

Cryptocurrency regulation, licensing regime multi-jurisdictional analysis, MiCA, regulatory evolution.

1. Introduction

Systemic risk events that occurred between 2020 and 2025, including the failure of the cryptocurrency exchange FTX and the Terra/Luna algorithmic stablecoins crisis, suggest the possible avenues through which the risks of the cryptocurrency market could spill over into the traditional financial system, leading researchers to reconsider the scope of the existing regulatory theories [1]. In dealing with the probable threats to macroeconomic financial stability stemming from the volatility of digital asset markets, regulatory authorities in different jurisdictions have fast-tracked legislative procedures [2]. Licensing procedures have now become the key regulatory tool due to their extensive functionality, including ex-ante access screening, ex-post accountability, and real-time compliance constraints. The United States, European Union, and China, as the world's three largest economies, have each developed distinct evolutionary paths for their licensing regimes. The United States has a multi-agency system related to compliance uncertainty [3], whereas China has developed a comprehensive prohibition pathway since 2021 [4]. At the same time, the European Union has made significant

progress in the development of a unified framework through the Markets in Crypto-Assets Regulation [5]. These developments raise the fundamental research question: what evolutionary paths have the licensing regimes in these three notable jurisdictions followed?

Existing literature has shown that the impact of regulatory policies on market liquidity and the efficiency of price discovery is significant [6], while the development of specialized regulations on stablecoins has achieved significant advancement [7]. However, the existing research on the regulation of cryptocurrency still reveals three major limitations: first, the analytical object of the research is fragmented in the form of general terms such as "regulatory policies," without a special focus on licensing regulations as a legal tool; second, the research design of the research is based on a static cross-sectional perspective without taking into consideration the dynamics of the evolution of regulations; and third, the analytical dimension of the research is missing [8].

This study outlines the following three objectives for conducting the research: tracing the legislative development of licensing regulations in the three main jurisdictions from 2020 to 2025, developing a four-dimensional analytical framework, and revealing the underlying institutional factors that influence regulatory developments. This study distinguishes three different dimensions of the contribution. First, the focus of analysis moves from "regulatory policies" to "licensing regimes" in a more specific sense. Second, the temporal dimension takes into consideration important stages in the development of financial regulation, such as the full implementation of the MiCA (2024), China's ten-ministry joint prohibition (2021), and the enactment of the FIT21 Act by the U.S. House (2024). Thirdly, the analytical perspective offers a further dimension: "evolution," which distinguishes three types of fragmentation: "fragmentation toward incremental consolidation," "fragmentation toward a unified framework," and "restriction toward comprehensive prohibition." The aim of this research is to create an analytical framework in four dimensions: the role of the regulatory authorities, the thresholds for market access, the obligations, and the enforcement mechanisms. It also undertakes empirical research, using the primary legal sources available in legal databases, to provide cross-national references for the emerging market economies.

2. Methodology

2.1. Analytical Legal Framework

The research methodology to be employed in this research is a multi-jurisdictional descriptive approach, which highlights the functional implementation of law instruments rather than their formal features. It is an appropriate methodology to be employed in analyzing the licensing of cryptocurrencies in different jurisdictions. Based on this approach, a four-dimensional model for multi-jurisdictional analysis will be proposed, with particular emphasis on the basic components. The analysis of the regulatory framework dimensions is as follows: (1) in the structure dimension, the allocation of licensing powers and coordinating mechanisms is examined; (2) in the market access dimension, requirements in terms of capital, qualifications, and permits are examined; (3) in the ongoing regulatory obligations dimension, disclosure requirements, auditing, and risk reserve provisions are examined; and (4) in the enforcement and penalty dimension, administrative fines, civil liability, and instruments of criminal prosecution are evaluated. The framework, as described in this study, is based on the risk-based regulatory guidance for virtual asset service providers, as developed by the Financial Action Task Force. This regulatory guidance provides a clear link between licensing access and anti-money laundering compliance requirements, thus providing an international methodological base for this study [9]. The specific content of the four-dimensional framework is summarized in Table 1.

Table 1. Four-Dimensional Analytical Framework

Dimension	Analytical Content	Analytical Indicators
Regulatory Authority Architecture	Institutional allocation of licensing powers and inter-agency coordination	Degree of centralization; coordination mechanisms
Market Access Threshold	Conditions for obtaining licenses	Minimum capital requirements; management qualifications; approval procedures
Ongoing Regulatory Obligations	Requirements for maintaining licenses	Disclosure frequency; audit mandates; risk reserve provisions
Enforcement and Penalty Mechanism	Approaches to addressing violations	Administrative fines; civil liabilities; criminal prosecution

Table 1 provides a comprehensive overview of the licensing regimes in the three major jurisdictions using a uniform method of analysis, wherein each dimensional indicator covers the entire range of the lifecycle of licensing regimes from entry to exit.

Though the four-dimensional approach provides a comprehensive description of institutional configurations, multi-jurisdictional research also needs to account for the reasons for the variety of configurations. To meet this need for an explanatory dimension, this study extends the analytical approach by incorporating an institutional determinants approach that examines two variables: legal traditions-distinguishing common law systems with their tendency to resolve disputes on a case-by-case basis, civil law systems with their preference for codification, and administrative dominant systems with their reliance on policy instruments; structures of financial systems-distinguishing capital market-dominated systems, bank-dominated systems, and state-owned financial systems. Moreover, the analysis of the pathways will include the examination of the regulatory drivers as well as the cross-border operational mechanisms in order to take into consideration the dynamic characteristics of the institutional evolution process. In the case of jurisdictions that have adopted the comprehensive prohibition, this study will also include the examination of alternative regulatory instruments. This combined strategy of descriptive analysis and contextual interpretation will enable a comprehensive understanding of regulatory developments in each jurisdiction.

2.2. Legal Sources and Research Scope

The primary legal texts for this study are derived from publicly accessible legal databases: the U.S. SEC EDGAR regulatory database (<https://www.sec.gov/rules>) and FinCEN rules repository (<https://www.fincen.gov/resources/statutes-and-regulations>), the EU EUR-Lex official legal database (<https://eur-lex.europa.eu>), the PKULaw database of China (<https://www.pkulaw.com>), and the FATF virtual asset regulatory guidance (<https://www.fatf-gafi.org/en/topics/virtual-assets.html>), supplemented by the Atlantic Council cryptocurrency regulation tracker (<https://www.atlanticcouncil.org/cbdctracker>). The jurisdictions selected cover three broad regulatory approaches used in the world. The USA reflects a multi-agency fragmented evolutionary trajectory, the European Union reflects a unified framework evolutionary trajectory, and China reflects a prohibition strengthening evolutionary trajectory, collectively illustrating diverse regulatory responses to cryptocurrency markets. The timeframe ranges from January 2020 to June 2025, covering important regulatory events such as the entire legislative cycle of the MiCA law, the strengthening of China's prohibition measures, and the implementation of the U.S. FIT21 Act. The general logic of the research design is represented in Figure 1.

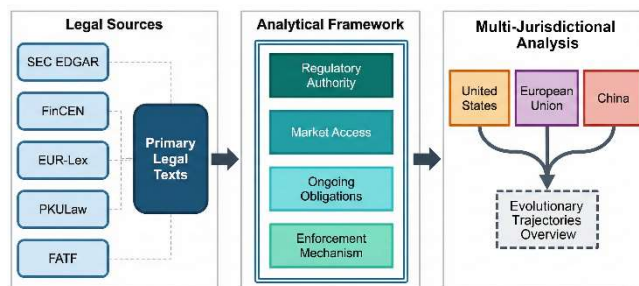


Figure 1. Research Design Flowchart

Figure 1 illustrates the entire research pathway, from primary legal sources, through the four-dimensional framework analysis, and onto the analysis of the evolutionary path, thus providing internal consistency in the methodological approach and the corresponding research question.

3. Results

3.1. United States: Fragmented Licensing with Incremental Clarification

The development of the U.S. cryptocurrency licensing structure from 2020 to 2025 includes several significant events. In 2020, the Office of the Comptroller of the Currency issued guidance on bank custody of crypto-assets, while the Financial Crimes Enforcement Network proposed expanding the scope of what is called the “travel rule.” In 2023, the Securities Exchange Commission filed litigation against Coinbase and Binance. In 2024, the Financial Innovation and Technology for the 21st Century Act was passed by the House of Representatives. At the state level, the New York BitLicense continued to revise its standards for access, while the Wyoming Special Purpose Depository Institution charter provided an alternative. As of 2025, a unified federal licensing system has yet to be established.

3.2. European Union: From Fragmentation to Harmonized Framework

The EU cryptocurrency licensing regime has developed from a well-defined process of legislative measures from 2020 to 2025. In September 2020, the European Commission published the Markets in Crypto-Assets Regulation draft. In June 2022, the European Parliament and the Council reached a political agreement. The regulation came into effect in June 2023, and the provisions on stablecoins came into application in June 2024. All provisions came into application in December 2024. The licensing parameters under the MiCA licensing regime include: authorization of Crypto Asset Service Provider, which includes ten categories of service provision; minimum capital requirements, which range between €50,000 and €150,000; Asset-Referenced Token issuers, who must maintain a reserve of 1:1; and Passporting, which allows for cross-border operation.

3.3. China: Consolidation of Comprehensive Prohibition

The Chinese regulatory policy with respect to cryptocurrency for the period between 2020 and 2025 has shown a trend of strengthening prohibitions. In May 2021, the State Council Financial Stability and Development Committee launched “cracking down on Bitcoin mining and trading activities”. In September 2021, the People’s Bank of China, along with nine other ministries, declared that all virtual currency-related business activities equate to “illegal financial activities,” thereby strengthening the prohibition policy to cover the entire range of activities, including mining, trading, and derivatives. From 2022 to 2025, the intensity of the regulations with respect to the enforcement of the prohibition policy has continued to rise.

The analyses carried out for individual jurisdictions provide an outline of the longitudinal evolution of each jurisdiction. In order to further understand the velocity differences and

rhythmic patterns of change in the three major jurisdictions in the temporal dimension, this study has extracted the milestone legislative promulgations, policy issuances, and enforcement action nodes from the period between 2020 and 2025. These have been arranged in a chronological manner in tabular form, as presented in Table 2.

Table 2. Key Milestones of Licensing Regime Evolution across Three Jurisdictions (2020-2025)

Jurisdiction	2020	2021	2022	2023	2024	2025
United States	OCC Custody Guidance ; FinCEN Travel Rule Proposal	—	—	SEC Litigation (Coinbase, Binance)	FIT21 House Passage	Framework pending
European Union	MiCA Draft Published (Sep)	—	Political Agreement (Jun)	MiCA Entry into Force (Jun)	Full Application (Dec)	Fully operational
China	—	FSDC Announcement (May); Ten-Ministry Prohibition (Sep)	Enforcement Intensification	Enforcement Intensification	Continued Enforcement	Continued Enforcement

Table 2 reveals three different patterns of evolution. The milestones in the USA are spread out over a period of time, while enforcement actions emerge as a dominant mode of regulation in 2023. The European Union shows a linear pattern of evolution from draft publication to full application. In China, prohibition measures are centered in 2021, followed by continuous enforcement.

3.4. Synthesis Across Jurisdictions

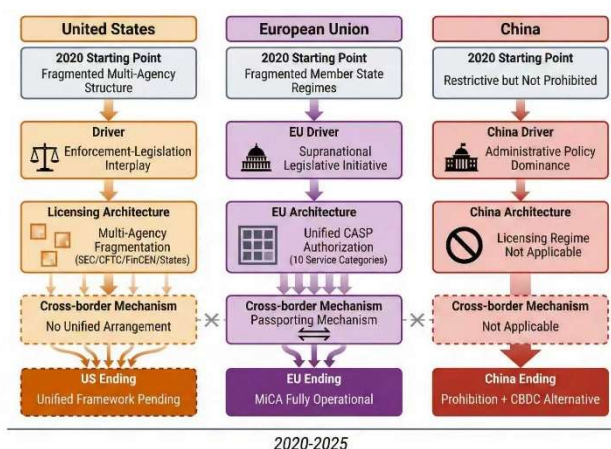


Figure 2. Evolutionary Pathways of Licensing Regimes in the US, EU, and China (2020-2025)

The chronological analysis revealed distinct paces of evolution in each jurisdiction. To synthesize the essential characteristics of the three evolutionary pathways in a structural way, this study also develops a diagram to outline the institutional evolution in each jurisdiction

from the initial conditions of 2020, through the driving forces and the configurations of the licensing architecture, to the status of 2025. The diagram applies dimensional selection to identify the key features of licensing regime evolution in each jurisdiction, as presented in Figure 2.

As shown in Figure 2, three different patterns of evolution can be identified: the evolution of the United States from multi-agency coordination towards a unified framework, which is pending and depends on the interaction of enforcement and legislation; the evolution of the European Union towards the full operation of MiCA, including a passporting mechanism for the provision of services across borders; and the evolution of China from restrictive measures towards a comprehensive prohibition, in which the central bank digital currency plays the role of a state-sponsored alternative.

The analysis of the pathways also revealed distinct characteristics in the evolution of directions and institutional outcomes in each jurisdiction. To present the regulation configurations systematically, this study applied the four-dimensional analytical framework, as described in the methodology section, to examine the regulation configurations in each jurisdiction. The four dimensions were related to the analytical indicators as revealed in Table 1, which are shown in Table 3.

Table 3. Institutional Characteristics under Four-Dimensional Framework

Dimension	United States	European Union	China
Regulatory Authority	Multi-agency fragmentation (SEC/CFTC/FinCEN/States)	Dual-layer coordination (ESMA + National Competent Authorities)	Multi-ministry joint enforcement (PBOC-led)
Market Access Threshold	Institution-dependent variation	Unified standards (€50,000–€150,000)	Prohibited access
Ongoing Obligations	Dispersed and overlapping	Unified and explicit	Not applicable
Enforcement Mechanism	Civil litigation-dominated	Administrative penalties-dominated	Combined administrative and criminal measures

Table 3 presents the key institutional characteristics along four dimensions in each jurisdiction: in terms of regulatory authorities, the United States features multi-agency fragmentation, the European Union features dual-layer coordination, and China features multi-ministry joint enforcement; in terms of market access, the United States features institution-dependent variation, the European Union features unified standards, and China features prohibited access; in terms of ongoing obligations, the United States features dispersed and overlapping requirements, the European Union features unified and explicit requirements, and China features non-applicability; in terms of enforcement, the United States features civil litigation, the European Union features administrative penalties, and China features combined administrative and criminal measures.

4. Discussion

Building on the findings presented above, the following section will discuss the institutional context underlying regulatory developments in each jurisdiction. The three evolutionary paths can be understood by examining legal traditions and financial system characteristics. At the legal tradition dimension, the common law legal tradition in the United States has been characterized by the integration of newly emerging phenomena within the existing frameworks of case law, with the Howey Test being consistently applied since 1946 in classifying

cryptocurrency securities. This explains the emergence of the SEC enforcement-driven regime while at the same time creating ambiguity in the demarcation of the boundaries. The EU civil law tradition is based on the systematization of statutory laws, with MiCA being a good example of the systematization characteristics that are typical of civil law. The existing literature suggests that the systematization of laws is effective in enhancing market transparency [10]. The Chinese legal system is marked by administrative predominance and policy precedence. The normative documents quickly address the risks in the market but are placed at a lower level of the legal hierarchy. At the dimension of financial system structure, the United States, which has a capital market-based financial system, has extended securities regulation logic to the domain of cryptocurrency. In terms of existing research on cross-jurisdictional studies of financial regulations, these studies underscore the challenges faced in terms of compliance due to fragmented regulatory frameworks [11]. In the case of the European Union, which has a bank-dominated financial system structure, there is facilitation in the adoption of prudential financial regulation frameworks, which range from €50,000 to €150,000 in this study. In China, which has a state-owned financial system dominance structure, regulatory priorities have emphasized financial stability, which has resulted in the adoption of a comprehensive prohibition approach.

Besides the structural components of the financial system, the topic of monetary sovereignty is worthy of academic research. Monetary policy autonomy protection represents a significant factor in China's prohibition on private cryptocurrencies. The research has established that China's prohibition has a significant impact on market interconnectedness [12]. Furthermore, it has been established that such prohibition measures may have unforeseen effects on corporate legal compliance and adaptability, thus underscoring a need for further research on the comprehensive effects of prohibition [13]. Each jurisdiction's approach has produced distinct outcomes for market development. In the United States, regulatory uncertainty has limited development while preserving space for the market. In the European Union, the regulatory certainty under the MiCA framework has provided market clarity. In China, the comprehensive prohibition has led to the isolation of systemic risk while excluding participation in the domestic market. In addition, in emerging market economies, it is important to evaluate the viability of these approaches in relation to the legal traditions of these countries and their market development stage, especially in relation to the transparency requirements for reserves in stablecoins as presented in the existing literature [14], and by referring to the FATF standards as best practice. Another important aspect is the relationship between the regulatory capacity and the market development stage.

The study also recognizes certain limitations. Firstly, there are timeliness issues due to the changing nature of the regulatory environment. The post-2025 legislative changes may alter the conclusions reached in this study. Secondly, this analysis is based on three main jurisdictions and does not cover other markets such as the UK, Japan, and Singapore. Thirdly, this analysis does not exhaustively cover the regulatory challenges facing new formats such as DeFi and NFTs. Lastly, the assessment of the institutions' impact could be enhanced by extending the period.

5. Conclusion

This study constructs a four-dimensional analytical framework comprising regulatory authorities, market access thresholds, ongoing obligations, and enforcement mechanisms. Compared to existing research that broadly discusses "regulatory policies," this framework focuses on "licensing regimes" as a specific legal instrument and introduces the dynamic dimension of "evolution." The results have shown that the United States has followed the "fragmentation toward incremental consolidation" transformation pathway, the European

Union has achieved the "fragmentation toward unified framework" transformation with the MiCA regulation fully applying in December 2024 and providing unified authorization with €50,000 to €150,000 capital requirements, and China has accomplished the unidirectional intensification of the "restriction toward comprehensive prohibition" transformation pathway. All of these transformation pathways have shown the influence of the legal traditions and the structures of the financial systems in the jurisdictions, which have the characteristics of path dependence and have had different effects on the markets. These findings align with existing research conclusions regarding unified frameworks enhancing transparency and prohibition measures affecting market interconnectedness patterns.

The four-dimensional framework is applicable to jurisdictions with accessible public legal databases that are in the construction phase of licensing regimes, providing differentiated pathway references for emerging market economies. Based on the findings, countries adopting gradual regulatory approaches are advised to establish reasonable transition periods following the MiCA model, with FATF standards serving as international anchors. Future research may extend to challenges posed by DeFi to licensing regimes, cross-border regulatory coordination mechanisms, and expansion to markets including the United Kingdom, Japan, and Singapore.

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