

Ecosystem-Based Modularity in National Banking Systems for Cross-Border Digital Finance

Yevhen Fomenko

Independent Researcher, PhD, Financial Practitioner, United Kingdom

Abstract

The transformation of global financial architecture driven by central bank digital currencies (CBDCs), distributed ledger technologies, smart contracts, and API-based payment infrastructures increasingly challenges the institutional configuration of national banking systems. While advanced economies benefit from high institutional stability, their financial systems are characterised by dense regulatory frameworks and complex multi-jurisdictional coordination, raising transaction and governance costs associated with experimentation in digital monetary and settlement technologies. Existing literature largely addresses these challenges within closed national or regional frameworks, leaving limited space for analysing cross-jurisdictional infrastructural complementarity.

This paper develops an institutional and ecosystem-based framework conceptualising national banking systems as modular components of global financial ecosystems. Selected infrastructural functions—such as testing environments, interoperability layers, and settlement mechanisms—can be functionally decomposed and allocated across jurisdictions with differing institutional characteristics without undermining monetary sovereignty. Such modularity allows advanced economies to preserve regulatory coherence while reducing coordination constraints associated with institutional change.

The Ukrainian banking system is employed as an analytical illustration of an institutionally flexible and digitally mature environment, characterised by extensive cashless payments and advanced digital banking infrastructure. In this context, Ukraine exemplifies a potential experimental and infrastructural platform complementing highly regulated financial systems. The proposed model reframes national banking systems as reactive, interoperable platforms rather than territorially bounded entities, offering insights for the governance of digital monetary innovation in advanced economies.

Keywords: CBDC; cross-border financial ecosystems; digital banking; financial market infrastructure; modularity; platform governance; transaction costs