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FINANCIAL, DIGITAL AND LEGAL MECHANISMS FOR REGULATORY COMPLIANCE IN NON-BANK FINANCIAL INSTITUTIONS

ABSTRACT

Ukraine's transition to risk-based prudential supervision requires non-bank financial institutions to connect formal regulatory obligations with measurable financial resilience, reliable data, governance, and professional competence. The purpose of this study is to assess the financial transformation and prudential compliance of selected Ukrainian non-bank financial institution segments, systematize applicable regulatory requirements, and develop an integrated framework linking financial, digital, legal, governance, and professional mechanisms. The analysis combines official National Bank of Ukraine data for insurance companies, finance companies, and credit unions, descriptive period comparisons, author-verified regulatory coding, and comparative analysis of continuing professional development frameworks. The results reveal market consolidation across all three segments but divergent balance-sheet trajectories: insurers and finance companies expanded their aggregate assets, whereas credit unions contracted. Governance and legal obligations dominate the primary-code structure of the selected regulatory requirements, while multiple coding shows that financial, digital, legal, governance, and professional components are interdependent. The study develops a financial-first conceptual framework in which prudential assessment forms the evidence-based core, digital tools support monitoring and traceability, legal mechanisms translate external requirements into internal obligations, and governance and professional competence operate as cross-cutting layers. The findings support differentiated implementation rather than a uniform compliance template for all non-bank financial institutions. The results may assist the National Bank of Ukraine, non-bank financial institutions, compliance, risk-management and internal-audit functions, professional associations, researchers, and policy specialists in designing proportionate control, reporting, governance, and professional-development systems.

Keywords: non-bank financial institutions, regulatory compliance, prudential supervision, market consolidation, financial resilience, asset quality, RegTech, corporate governance, continuing professional development, AI governance

JEL Classification: G23, G28, G32, M42, O33

INTRODUCTION

Ukraine's non-bank financial sector has entered a stage in which prudential supervision is increasingly linked to the actual financial capacity, governance quality and data discipline of institutions rather than to the formal presence of internal documents alone. Since the National Bank of Ukraine (NBU) assumed responsibility for the non-bank financial services market, the regulatory perimeter has been reshaped by new legislation on financial services, insurance, financial leasing and credit unions, as well as by NBU regulations on authorization, prudential requirements, inspections, corrective measures, governance and internal control (National Bank of Ukraine [NBU], n.d.; NBU, 2023a, 2023b, 2023c, 2023d, 2023e, 2023f, 2024b, 2024c; Verkhovna Rada of Ukraine, 2021a, 2021b, 2021c, 2023). The introduction of significance criteria and official lists for finance companies and insurers further supports a differentiated and proportionate supervisory approach (NBU, 2025a, 2026a, 2026b).

This regulatory shift raises a financial question before it raises a purely legal one: which mechanisms allow non-bank financial institutions to remain solvent, transparent and

controllable when the market structure changes? The answer cannot be uniform because insurance companies, finance companies and credit unions have different balance-sheet structures, liabilities, clients or members, reporting obligations and prudential-risk profiles. Leasing and factoring are therefore considered in this study as activities of finance companies rather than as separate primary segments.

The descriptive financial evidence used in this article indicates market consolidation with divergent balance-sheet trajectories. Between 2021 and 2025, the number of insurers, finance companies and credit unions declined substantially. At the same time, aggregate assets increased among insurers and finance companies, while credit unions contracted both in number and asset size. This pattern is interpreted as reflecting both market exit or concentration and a strengthening of the scale or capital base of surviving institutions, without attributing either change solely to the 2024 reform.

Consolidation creates three prudential priorities. First, a smaller number of institutions may become more significant for supervisory purposes. Second, larger surviving institutions may generate increased interconnectedness and counterparty concentration, including banking and related-party exposures. Third, greater operational, governance and risk-management complexity requires stronger internal control, audit, compliance and digital monitoring. Consumer and member protection remains a cross-cutting conduct risk, particularly for insurers and credit unions, when consolidation is not accompanied by stronger complaint handling and governance controls.

Existing studies separately discuss NBFI financial stability, insurance solvency, leasing and factoring, cooperative finance, RegTech, corporate governance, fit and proper requirements and professional competence. What remains insufficiently developed is an evidence-based framework that connects financial indicators, regulatory obligations, digital monitoring, legal implementation, governance and professional competence in a single compliance architecture for selected Ukrainian NBFI segments.

The contribution of this article is threefold. First, it provides a descriptive comparison of the financial transformation of insurers, finance companies, and credit unions using official NBU data for 2021-2025 and Q1 2026 versus Q1 2025. Second, it combines this financial evidence with author-verified FIN-DIG-LEG-GOV-PROF regulatory coding and comparative CPD analysis. Third, it proposes a financial-first integrated framework and segment-specific practical recommendations for implementing regulatory compliance mechanisms under prudential supervision.

LITERATURE REVIEW

The literature on non-bank financial intermediation increasingly treats non-bank financial institutions as a heterogeneous regulatory population rather than as a residual category outside banking. Financial Stability Board (FSB) materials define the NBFI ecosystem as a diverse set of entities, activities and infrastructures with different business models, balance-sheet structures, governance arrangements and regulatory frameworks. This heterogeneity is directly relevant for Ukraine because insurers, finance companies and credit unions generate different prudential risk profiles and cannot be assessed through a single compliance template (Financial Stability Board, n.d.; Montagner, 2025).

Financial-stability research on NBFIs emphasizes that the transmission of risk depends on funding structures, liquidity channels, leverage, interconnectedness, and the ability of institutions to absorb losses under stress (Aramonte et al., 2021; Carstens, 2021; Financial Stability Board, 2025). For the present study, this literature supports a financial-first architecture: regulatory compliance must be assessed not only as formal adherence to legal obligations, but as the capacity of institutions to maintain capital, asset quality, liquidity, and reliable reporting under changing supervisory requirements.

International standards issued by the Basel Committee on Banking Supervision, the Financial Action Task Force (FATF), the Organisation for Economic Co-operation and Development (OECD), and the International Financial Reporting Standards (IFRS) framework are not directly applicable in their full banking or global form to Ukrainian NBFIs. Their value in this article is methodological: they provide benchmarks for risk-based governance, anti-money laundering and countering the financing of terrorism controls, digital finance, and asset recognition. The proposed framework therefore uses international benchmarks to structure a proportionate model for the three selected Ukrainian segments rather than mechanically transferring banking rules (Basel Committee on Banking Supervision, 2019; Financial Action Task Force, 2026; IFRS Foundation, 2024; OECD, 2020).

Insurance Companies: Solvency, Assets, Reserves and Governance

Insurance-sector scholarship links solvency to capital, asset quality, reserve coverage, asset-liability management, liquidity and governance. Rae et al. (2018) reviewed whether Solvency II achieved its objectives and concluded that the regime improved the earlier solvency framework but left unresolved questions concerning asset-liability management, liquidity,

procyclicality and disclosure. Their assessment provides a basis for treating insurers as a distinct prudential segment rather than as a generic NBFIs category.

Ukrainian evidence adds a sector-specific financial-stability perspective. Abernikhina et al. (2021) systematized methodological approaches to assessing insurance-company financial stability and showed that such assessment requires a combination of interrelated indicators rather than reliance on a single ratio. This approach supports the present study's use of assets, capital, profitability, solvency breaches, and reserve-related controls as complementary evidence.

Governance research also identifies insurer-specific control mechanisms. Ames et al. (2018) empirically examined board risk committees and found associations with insurer financial-strength ratings and performance, demonstrating that risk oversight at board level can affect outcomes observable to external stakeholders. The European Insurance and Occupational Pensions Authority's Guidelines on System of Governance provide the related regulatory context by defining risk management, internal control, and group governance as core elements of prudential supervision (European Insurance and Occupational Pensions Authority, 2015).

Digitalization changes both the insurance value chain and the control environment. Eling and Lehmann (2018), through a review of 84 academic and industry studies, identified effects on risk selection, claims, data use, and insurability. Eling et al. (2022) extended this research to artificial intelligence and showed that AI can reshape multiple stages of the insurance value chain while also creating new governance and insurability challenges. These findings support linking digital treasury and data-quality controls to measurable insurance indicators rather than treating technology as a stand-alone narrative.

Finance Companies, Consumer Finance, Factoring and Financial Leasing

Finance companies differ from insurers and credit unions because their prudential profile is driven mainly by capital structure, asset quality, receivables, counterparty exposure, service mix, and funding.

Buchak et al. (2018) used U.S. mortgage-market data to show how FinTech and shadow-bank growth can be associated with regulatory arbitrage and changing intermediation channels. Although the institutional setting differs from Ukraine, the study demonstrates why non-bank lenders require supervision that connects business-model expansion to capital, funding, and conduct risks.

Gopal and Schnabl (2022) used loan-level evidence on small-business credit to document the expansion of finance companies and FinTech lenders after reductions in bank lending. Their findings show that non-bank lenders may substitute for banks without replicating bank funding structures, which is relevant to the article's separate treatment of finance-company capital, portfolio composition, and digital reporting controls. The Bank for International Settlements (2024) provides a complementary policy benchmark for non-bank retail lenders in the digital era.

Factoring and financial leasing are treated in this study as finance-company activities rather than separate primary segments. Klapper (2006) analyzed factoring as receivables-based finance and showed that it can shift the focus of credit assessment from the supplier to the quality of buyers and receivables. This result supports controls over receivable eligibility, obligor concentration, disputes, collections, and counterparty exposure.

The Ukrainian leasing literature addresses distinct dimensions of the activity. Kulyniak and Dziurakh (2019) examined market dynamics and structural development trends. Hridina (2017) treated leasing as an investment mechanism and an alternative to bank credit under financial instability. Andros (2024) assessed leasing as a financing instrument for agricultural business entities and emphasized its practical advantages relative to conventional credit.

Belianko (2024) examined the development potential of financial leasing in the context of European integration. Sholoiko and Klymenko (2025) considered wartime challenges and environmental, social, and governance principles in leasing-market development. Petrashevskaya et al. (2023) classified leasing types and compared their advantages and disadvantages, whereas Peretiutko and Nahorni (2023) systematized prospective research directions. Together, these works justify attention to leased-asset valuation, residual value, concentration, and counterparty risk without treating leasing as an independent analytical segment.

Accounting and audit studies clarify how these risks enter internal control. Nikolaeva and Prokopenko (2015) examined internal audit within a leasing-company risk-management system and positioned audit as a control mechanism rather than a formal reporting function. Prokopenko (2016) analyzed NBFIs as financial-market institutions, while Prokopenko (2017) focused on the accounting dimensions of their regulatory and legal environment. These contributions support linking prudential indicators to accounting evidence, internal audit, and documented control procedures.

Credit Unions: Capital, Liquidity, Loan Quality and Cooperative Governance

Credit unions require a separate literature block because their cooperative model changes the logic of governance, risk appetite and member protection. McKillop and Wilson (2011) provided a theoretical and empirical overview showing that credit unions across jurisdictions share questions of objectives, efficiency, technology adoption, product diversification, mergers, failures and capital regulation. McKillop et al. (2020) extended the review to sustainability, FinTech, and the contribution of cooperative financial institutions to the real economy.

This scholarship explains why capitalization, liquidity, deposits, loan quality, and cooperative governance are central to credit-union resilience. El Fadil and Hessou (2024) added an asset-liability-management perspective by examining how the composition of assets and liabilities affects U.S. credit-union performance. Together with the Ukrainian Law on Credit Unions and NBU prudential regulation, these findings support a differentiated model built around proportional capital and liquidity controls, loan-quality monitoring, member-oriented governance, and reliable digital reporting.

Governance, Compliance, Internal Control and Professional Suitability

Research on financial-institution governance shows that formal risk policies are insufficient unless they influence actual decision-making. Stulz (2016) emphasized risk culture, governance and managerial incentives, while Rampini et al. (2020) linked risk management to financing constraints and institutional behavior. Aebi et al. (2012) found that risk-management governance arrangements, including the position and reporting line of the chief risk officer, were associated with bank performance during the financial crisis.

Ellul and Yerramilli (2013) constructed a risk-management index for U.S. bank holding companies and found that stronger and more independent risk controls were associated with lower exposure to risky assets, fewer non-performing loans, and lower downside risk. Although these studies focus mainly on banks, their evidence supports the cross-cutting governance layer of the present framework: board oversight, independent challenge, escalation, and internal audit must connect financial indicators to decisions.

Domestic accounting and audit research provides a complementary implementation perspective. Nikolaeva and Prokopenko (2015) showed how internal audit can be integrated into leasing-company risk management. Prokopenko (2016) emphasized the institutional role of NBFIs in the financial market, and Prokopenko (2017) connected their regulatory environment with accounting information. These contributions support the article's treatment of compliance, risk management, accounting, and internal audit as mutually reinforcing rather than isolated functions.

Professional competence is an additional control mechanism. De Lange et al. (2015), based on responses from 1,310 professional accountants in the Asia-Pacific region, found that professional-development standards are becoming more unified while perceptions and practices remain heterogeneous. This result supports a hybrid approach that combines a common baseline with role- and risk-specific modules. NASAA, IRS, and EU Insurance Distribution Directive requirements are therefore used as comparative professional-regulation benchmarks rather than as mechanically transferable Ukrainian rules.

RegTech, Digital Reporting and AI-Enabled Compliance

The RegTech literature supports a move from periodic formal compliance toward continuous data-driven monitoring. Arner et al. (2017) described RegTech as a reconceptualization of financial regulation around data and digital processes. Anagnostopoulos (2018) examined how FinTech and RegTech reshape the roles and responses of regulators and banks. Buckley et al. (2020) analyzed the European path to RegTech and showed how reporting obligations, data standardization, and regulatory architecture can drive technology-enabled compliance. Butler and O'Brien (2019), drawing on a multi-year research program, framed RegTech as a means of making digital regulatory compliance more efficient and effective.

The FSB (2020) provides a policy-level complement by identifying potential gains in supervision, surveillance, and reporting while warning that excessive reliance on measurable signals can create blind spots. In the present study, digital tools are therefore mapped to specific financial controls - data reconciliation, asset-quality dashboards, liquidity alerts, counterparty limits, AML/CFT monitoring, digital treasury, and escalation workflows - rather than treated as autonomous substitutes for governance.

Research on artificial intelligence adds requirements for interpretability and accountability. Rudin (2019) argued that high-stakes decisions should prioritize inherently interpretable models rather than rely only on explanations of black boxes.

Bussmann et al. (2021) proposed explainable machine-learning methods for credit-risk management, illustrating how prediction and explanation can be connected in financial applications. Kroll et al. (2017) showed that algorithmic accountability depends on technical verification together with institutional and legal mechanisms.

Fritz-Morgenthal et al. (2022) translated these concerns into a financial-sector governance and testing framework for explainable, trustworthy, auditable, and manageable AI in production. These studies support the need for human oversight, evidence, model-risk controls, and escalation. Kateryna Shcheglova's Invariance-based AI Governance through Distributed Risk Consensus methodology is treated as an author-developed conditional extension of the digital block and is cited as a registered scientific work (Shcheglova, 2026); it is not included in the regulatory coding.

The Financial Conduct Authority's (FCA) Consumer Duty and fair-value materials provide a limited policy benchmark for the consumer-outcome logic of the Conduct Sentinel. FCA (2023) identified the relevance of evidence, differential outcomes, data, and governance to fair-value assessments while clarifying that its review did not create new requirements. The material is therefore used methodologically and is not presented as Ukrainian law.

Research Gap and Contribution

Existing scholarship has examined NBFI financial stability, insurance solvency, finance-company and leasing activities, credit-union governance, RegTech, internal control, professional competence and AI accountability. However, this research remains fragmented across sectors and functions, and integrated treatment of financial evidence, digital monitoring, legal implementation, governance, and professional competence across the three selected Ukrainian segments remains limited.

The present study addresses this gap by combining descriptive financial analysis for 2021-2025 and Q1 2026 versus Q1 2025 with author-verified FIN-DIG-LEG-GOV-PROF coding, comparative CPD analysis, and a financial-first conceptual framework. Its contribution lies in connecting observed segment dynamics to a shared compliance architecture while preserving differentiated implementation for insurers, finance companies, and credit unions.

AIMS AND OBJECTIVES

The study aims to assess the financial transformation and prudential compliance of selected Ukrainian non-bank financial institution segments, systematize the applicable regulatory requirements, develop an integrated conceptual framework linking financial, digital, legal, governance, and professional mechanisms, and formulate segment-specific practical recommendations for implementation.

To achieve this aim, the following objectives were defined:

1. Analyze the financial dynamics of insurance companies, finance companies, and credit unions during 2021-2025.
2. Compare selected financial indicators for Q1 2026 with Q1 2025, without comparing an incomplete quarterly period with the full year 2025.
3. Identify segment-specific financial-prudential risks and the implications of market consolidation.
4. Map author-verified regulatory requirements using the FIN-DIG-LEG-GOV-PROF coding structure.
5. Conduct a comparative CPD and ongoing-competence analysis using Ukraine, NASAA IAR, IRS-enrolled agents, and the EU Insurance Distribution Directive as benchmarks.
6. Connect financial indicators with digital monitoring, legal implementation, governance, and professional competence mechanisms.
7. Construct an integrated financial, digital, and legal conceptual framework for NBFI regulatory compliance.
8. Formulate segment-specific practical recommendations for insurers, finance companies and credit unions.
9. Position Kateryna Shcheglova's copyright-registered Invariance-based AI Governance through Distributed Risk Consensus methodology (Certificate of Copyright Registration No. 149303) as a conditional conceptual extension of the digital block.

METHODS

Research Design

The study uses a combined descriptive and institutional research design. It integrates descriptive financial analysis, comparative-period analysis, regulatory inventory, author-verified thematic coding, comparative institutional analysis of continuing professional development (CPD) and ongoing competence, and conceptual synthesis. The quantitative component describes changes in the structure and financial indicators of three segments of the Ukrainian non-bank financial sector. The regulatory component maps selected statutory and supervisory requirements to five analytical categories. The comparative component examines how four professional-regulation frameworks maintain competence over time. The final conceptual stage links these evidence streams to a financial-first compliance framework.

The design is not econometric and does not estimate the causal effect of the 2024 regulatory reforms. It uses aggregated open data rather than confidential institution-level supervisory records. Consequently, the analysis identifies observed patterns, period differences, and regulatory associations; it does not establish that a specific legal change caused a particular financial outcome.

Scope, Segments, and Period

The financial analysis covers insurance companies, finance companies, and credit unions. Pawnshops are excluded because their business model, collateral structure, and data series would require a separate analytical design and would dilute the three-segment comparison included in the analysis. Financial leasing and factoring are treated as services or operations reported for finance companies rather than as independent analytical segments.

Annual observations cover 2021–2025. The years 2021–2023 are used as a baseline period and 2024–2025 as an early post-reform period. The term “baseline” is preferred to “pre-reform” because the transfer of supervisory responsibilities to the National Bank of Ukraine and several legal changes began before 2024. The most recent observation is analyzed separately as Q1 2026 versus Q1 2025; Q1 2026 is not compared with the full 2025 year because stock and flow indicators would be temporally inconsistent.

Financial Data Sources

The financial dataset was constructed exclusively from open official publications of the National Bank of Ukraine (NBU), primarily the Non-bank Financial Sector Review and its machine-readable annexes. Eight source records were used: the May 2022 annex, the March 2024 annex, the May 2025 review and annex, the March 2026 review and annex, and the May 2026 review and annex. Machine-readable XLSX annexes were treated as the primary source for numerical values, while PDF reviews and publication pages were used to interpret definitions, reporting changes, prudential-breach counts, and market developments. Table 1 lists the source identifiers, reporting periods, formats, and principal indicators. The source set is cited as National Bank of Ukraine (2022, 2024e, 2025b, 2025c, 2026c, 2026d, 2026e, 2026f).

The source register distinguishes the publication date, the reporting period covered by the source, and the date of access. This distinction is necessary because a 2026 publication may contain historical series beginning in 2021 and because Q1 observations are published after the reporting date.

Data Construction and Validation

Each observation was stored using the fields Period, Frequency, Segment, Indicator, Value, Unit, Source ID, source date, reporting basis, and comparability note. Stock indicators, such as assets, equity, deposits, and the number of active institutions, were recorded at the period end. Flow indicators, including premiums, claims, profits, new lending, factoring, leasing, and guarantees, were linked to the period over which they accumulated. Annual and quarterly observations were maintained in separate data tables.

Validation included source-level duplicate checks, cross-checks between review narratives and annex values, confirmation of units, and a review of missing and noncomparable observations. Comparable 2021 profit data were not available in the same reporting form because the May 2022 annex documented incomplete Q4 2021 reporting. Therefore, annual profit comparisons begin in 2022. Missing values were not imputed. Where definitions, reporting coverage, or regulatory status changed, the series was either restricted to a comparable subperiod or retained with an explicit limitation.

Data organization, descriptive analytics, calculations, and spreadsheet-based validation were performed using Microsoft Excel (version 16.111.2). Figures were created using the built-in drawing and charting tools of Microsoft Word (version 16.111.2).

Financial Indicators and Formulas

The following calculations were used only where the underlying observations were comparable:

Absolute change: $\Delta X = X_2 - X_1$

Growth rate: $g = (X_2 / X_1 - 1) \times 100\%$

Q1 year-on-year change: $g_{Q1} = (X_{Q1\ 2026} / X_{Q1\ 2025} - 1) \times 100\%$

Dynamics index: $I_t = (X_t / X_{2021}) \times 100$, with 2021 as the base when the series was comparable.

Segment asset share: $Assets_i / total\ assets\ of\ the\ three\ analyzed\ segments \times 100\%$. The result is not presented as a share of the entire NBFI sector.

Equity-to-assets ratio: $aggregate\ equity / aggregate\ assets \times 100\%$. It is a structural capitalization measure, not a statutory capital-adequacy ratio.

Average assets per active institution: $aggregate\ segment\ assets / number\ of\ active\ institutions$. This measure does not describe the institution-level distribution.

Market-exit and regulatory-breach measures were used only when the numerator and denominator referred to the same segment and period.

Insurance payout and concentration indicators were used only when the source provided a consistent definition or sufficient data. No Herfindahl-Hirschman Index (HHI) was reconstructed from incomplete market shares.

Return on assets (ROA) was not calculated uniformly across all three segments because comparable opening and closing asset bases and profit measures were not available for every year. The NBU-reported ROA for finance companies was used only for the Q1 comparison where the source provided the indicator directly.

Comparability Audit

Before calculation, each indicator was checked for changes in name, measurement, reporting basis, institutional coverage, legal status, and segment classification. The audit also distinguished nominal from adjusted values, stock from flow indicators, complete from incomplete reporting periods, and institution counts from service volumes. Methodological breaks were not bridged mechanically. The 2022 wartime shock, market exits, the 2024 legal transition, and changes in reporting requirements are treated as competing explanations for observed differences. These factors prevent causal attribution and require cautious wording such as “was observed during,” “coincided with,” or “was associated with.”

Regulatory Inventory and Author-Verified Coding

The regulatory inventory covers laws and NBU acts applicable to insurers, finance companies, credit unions, and general NBFI activities. The unit of coding is an individual regulatory requirement rather than an entire act. Each unit received a primary code and, where materially relevant, one or more secondary codes under a predefined codebook: FIN (capital, liquidity, asset quality, solvency, reserves, and concentration); DIG (digital reporting, RegTech, data quality, cybersecurity, digital treasury, and AI-enabled controls); LEG (authorization, licensing, statutory duties, reporting, disclosure, inspections, and corrective measures); GOV (governance, risk management, compliance, internal control, internal audit, and anti-money laundering and countering the financing of terrorism (AML/CFT) governance); and PROF (fit and proper, competence, business reputation, CPD, and professional certification). The inventory draws on the general legal foundations for the NBU, accounting, audit and AML/CFT, the sectoral laws, and the corresponding NBU authorization, prudential, governance, inspection and enforcement acts (NBU, 2023a, 2023b, 2023c, 2023d, 2023e, 2023f, 2024a, 2024b, 2024c, 2024d; Verkhovna Rada of Ukraine, 1999a, 1999b, 2017, 2019, 2021a, 2021b, 2021c, 2023).

Multiple coding was permitted because a single reporting or governance requirement may have financial, legal, and digital implications simultaneously. The matrix was independently reviewed and approved by the authors. The final analytical sample contains 22 regulatory requirements; a contextual NBU review row and the author-developed AI methodology were excluded from the count because they are not regulatory requirements. Coding frequencies are used for structural mapping

only. Primary-code shares and nonexclusive code frequencies are distinct representations, and a higher count does not imply greater legal importance.

Comparative CPD and Ongoing-Competence Analysis

The study compares four frameworks: the Ukrainian fit-and-proper and governance framework for NBFIs; the NASAA Investment Adviser Representative Continuing Education model; the IRS continuing-education regime for enrolled agents; and the European Union Insurance Distribution Directive (IDD). The IDD was selected as the European benchmark because it contains an explicit annual professional-development requirement and is directly relevant to insurance distribution. Its sector-specific nature is retained as a limitation; it is not treated as a general rule for finance companies or credit unions. The official comparative sources are the NASAA model rule and FAQ, IRS enrolled-agent guidance, and Directive (EU) 2016/97 (European Parliament and Council, 2016; Internal Revenue Service, n.d.; North American Securities Administrators Association, 2020, n.d.).

The frameworks were compared by professional status, target roles, initial qualification, periodic reassessment, CPD cycle, quantified hours or credits, ethics content, regulatory or product-knowledge content, approved providers, recordkeeping, oversight, consequences of noncompliance, authorization linkage, and transferability to each Ukrainian segment. Official Ukrainian, NASAA, IRS, and EUR-Lex sources were used. NASAA, IRS, and IDD rules are comparative professional-regulation benchmarks, not directly applicable standards for Ukrainian NBFIs.

Construction of the Conceptual Framework

The conceptual framework is constructed through triangulation rather than direct empirical estimation. The financial analysis identifies segment-specific pressures and structural changes; the regulatory coding maps requirements across financial, digital, legal, governance, and professional categories; and the CPD comparison identifies mechanisms for maintaining competence. These elements are connected to digital monitoring and legal implementation tools in the framework presented in Figure 5 and the segment-specific matrix in Table 7.

AI Governance Extension

The AI governance component was treated methodologically as a conditional conceptual extension of the digital block rather than as a regulatory-coding unit or an empirically tested result. The analysis used Shcheglova's copyright-registered methodology (Shcheglova, 2026) only to structure invariant conditions, domain-specific monitoring, risk-consensus logic, and human-governed autonomy boundaries for AI-enabled or autonomous workflows.

Methodological Limitations

Financial data are aggregated and do not permit institution-level distributional or causal analysis. Reporting-method changes and market exits restrict the comparability of some indicators. The 2022 wartime shock and broader macroeconomic conditions overlap with the regulatory transition. The post-2024 observation window is short and should be characterized as an early post-reform period. Profit data for 2021 were not used because comparable complete reporting was unavailable. A common equity-to-assets or profitability series could not be calculated consistently for all segments. International CPD benchmarks differ in professional scope and cannot be transferred mechanically. The AI governance extension remains conceptual and requires separate validation in specific NBFI use cases.

RESULTS

Financial Transformation of the Analyzed NBFI Segments

The annual data show a decline in institution numbers across all three segments and different asset trajectories. Table 1 identifies the official data sources and comparability limits, and Table 2 reports the annual indicators.

Table 1. Data sources, indicators and comparability limitations. (Source: developed by the authors from official NBU reviews and statistical annexes)

Source	Publication	Period	Segments	Use / limit
NBU-REV-2026-05	NBFI Review, May 2026	Q1 2026	All three	Review + annex
NBU-XLSX-2026-05	Review annex, May 2026	Q1 2026; history	All three	Main Q1/history source
NBU-REV-2026-03	NBFI Review, Mar. 2026	2025 annual	All three	Annual review
NBU-XLSX-2026-03	Review annex, Mar. 2026	2025; Q1 2025	All three	2025/Q1 comparator
NBU-REV-2025-05	NBFI Review, May 2025	Q1 2025	All three	Q1 review
NBU-XLSX-2025-05	Review annex, May 2025	Q1 2025	All three	Q1 cross-check
NBU-XLSX-2024-03	Review annex, Mar. 2024	2022-2023	All three	Profit/loss series
NBU-XLSX-2022-05	Review annex, May 2022	Q4 2021	All three	2021 limitation

Table 2. Financial dynamics of insurers, finance companies and credit unions, 2021-2025. Note: Assets, equity, and loan portfolios are in UAH billion; profit/loss is in UAH million; pp = percentage points. The 2021 profit values were excluded where comparable reporting was unavailable. (Source: authors' calculations based on official NBU data)

Segment	Indicator	2021	2022	2023	2024	2025	Δ 2021-2025
Insurers	Institutions	155	128	101	65	57	-63.226%
Insurers	Assets, UAH billion	64.737	70.298	74.412	72.53	93.861	44.989%
Insurers	Profit/loss, UAH million		3353.986	2446.136	3946.86	6849.776	104.228%
Finance companies	Institutions	922	760	559	479	411	-55.423%
Finance companies	Assets, UAH billion	216.406	243.997	250.454	310.741	288.692	33.403%
Finance companies	Equity, UAH billion	44.15	69.426	73.936	105.934	142.977	223.841%
Finance companies	Profit/loss, UAH million		1824.329	8542.088	12532.57	13099.235	618.03%
Credit unions	Institutions	278	162	133	104	85	-69.424%
Credit unions	Assets, UAH billion	2.33	1.449	1.422	1.357	1.249	-46.393%
Credit unions	Loan portfolio, UAH billion	2.015	1.248	1.192	1.094	0.999	-50.405%
Credit unions	NPL ratio	0.199	0.385	0.34	0.324	0.294	9.554 pp
Credit unions	Profit/loss, UAH million		-69.42	35.412	27.1	21.6	91.02 million

From 2021 to 2025, active insurers declined from 155 to 57 (-63.2%), while total assets increased from UAH 64.74 billion to UAH 93.86 billion (+45.0%).

Finance companies declined from 922 to 411 (-55.4%). Their assets increased from UAH 216.41 billion to UAH 288.69 billion (+33.4%), and equity increased from UAH 44.15 billion to UAH 142.98 billion (+223.8%). The aggregate equity-to-assets ratio rose from 20.4% to 49.5%; this is a structural measure, not a statutory capital-adequacy ratio.

Credit unions declined from 278 to 85 (-69.4%). Their assets fell from UAH 2.33 billion to UAH 1.25 billion (-46.4%), and the loan portfolio fell from UAH 2.02 billion to UAH 1.00 billion (-50.4%). The aggregate non-performing loan (NPL) ratio was 19.9% in 2021, 38.5% in 2022, and 29.4% in 2025.

Figures 1 and 2 present institution counts and indexed asset dynamics for 2021-2025.

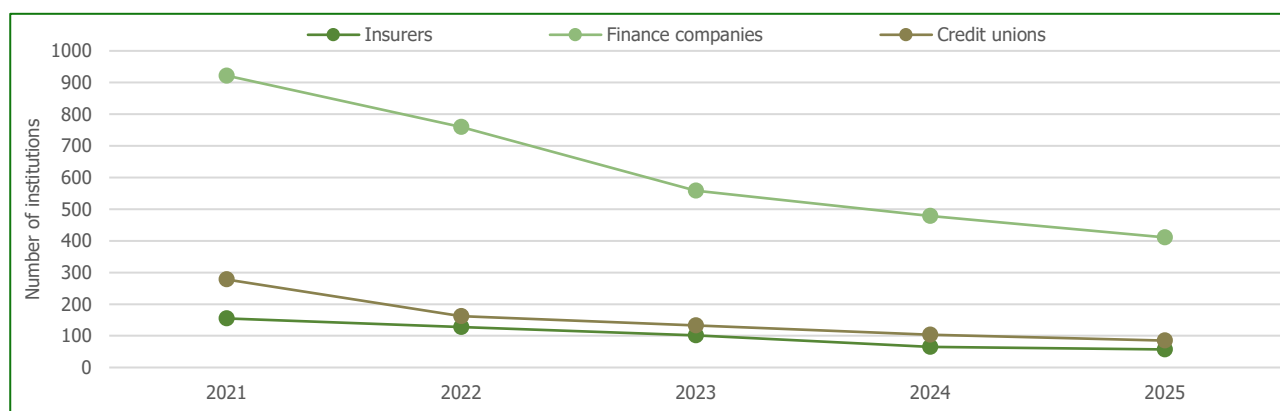


Figure 1. Number of insurers, finance companies, and credit unions, 2021-2025. (Source: authors' calculations based on official NBU data)

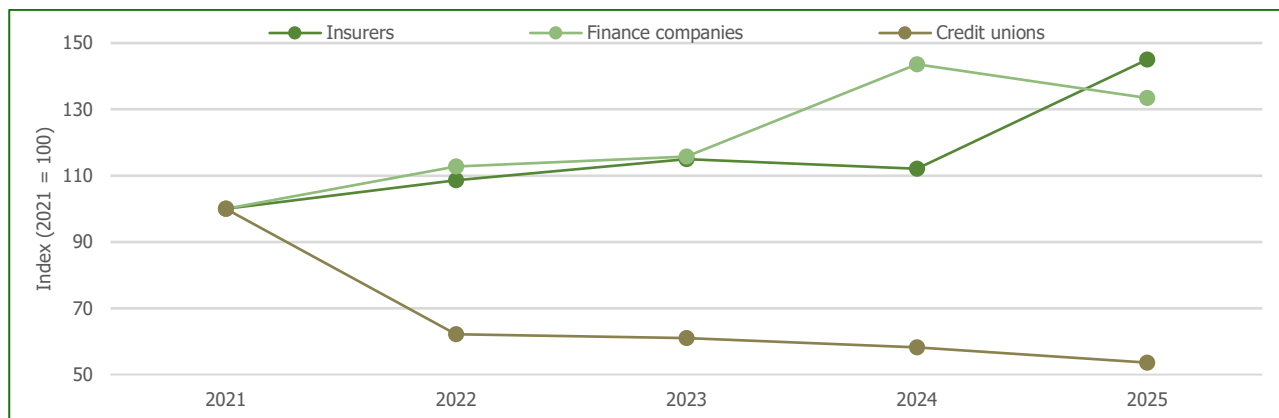


Figure 2. Asset dynamics by segment, 2021-2025 (2021 = 100). (Source: authors' calculations based on official NBU data)

Table 3 and Figure 3 report the separate Q1 2026 versus Q1 2025 comparison. Insurer assets increased by 25.5% and profit by 27.0%, while the number of insurers declined by 9.5%; institutions breaching the solvency capital requirement (SCR) or minimum capital requirement (MCR) fell from three to one. Finance-company assets declined by 5.8%, while equity increased by 35.5%, the credit portfolio by 25.9%, factoring by 14.1%, and financial leasing by 36.4%; minimum-equity breaches fell from seven to two. Credit-union assets declined by 9.3%, deposits by 6.8%, and the financial result changed from a loss of UAH 16.3 million to a profit of UAH 5.6 million.

Table 3. Financial indicators: Q1 2026 versus Q1 2025. Note: Assets, equity, portfolios, premiums, and service volumes are reported in UAH billion; profit/loss values are reported in UAH million. (Source: authors' calculations based on official NBU Q1 data. Q1 2026 is compared only with Q1 2025. Financial values are in UAH billion unless identified as UAH million)

Segment	Indicator	Q1 2025	Q1 2026	Δ	Unit
Insurers	Institutions	63	57	-9.524	%
Insurers	Assets	76.906	96.49	25.465	%
Insurers	Profit/loss	1208.784	1534.584	26.953	%
Insurers	Life premiums	1.41	1.51	7.092	%
Insurers	Non-life premiums	14	16.61	18.643	%
Insurers	SCR/MCR breaches	3	1	-2	institutions
Finance companies	Institutions	451	399	-11.53	%
Finance companies	Assets	307.079	289.348	-5.774	%
Finance companies	Profit/loss	3453.808	3836.24	11.073	%
Finance companies	Equity	106.68	144.534	35.484	%
Finance companies	Equity/assets	34.74	49.952	15.211	pp
Finance companies	Loan portfolio	104.512	131.587	25.907	%
Finance companies	Loans volume	31.421	38.648	23.003	%
Finance companies	Factoring volume	17.756	20.263	14.124	%
Finance companies	Leasing volume	6.707	9.149	36.402	%
Finance companies	Guarantees volume	7.616	28.284	271.388	%
Finance companies	Minimum-equity breaches	7	2	-5	institutions
Credit unions	Institutions	98	81	-17.347	%
Credit unions	Assets	1.323	1.2	-9.319	%
Credit unions	Profit/loss	-16.3	5.6	21.9	UAH million
Credit unions	Deposits	0.42	0.391	-6.796	%
Credit unions	Equity proxy	0.398	0.468	17.725	%

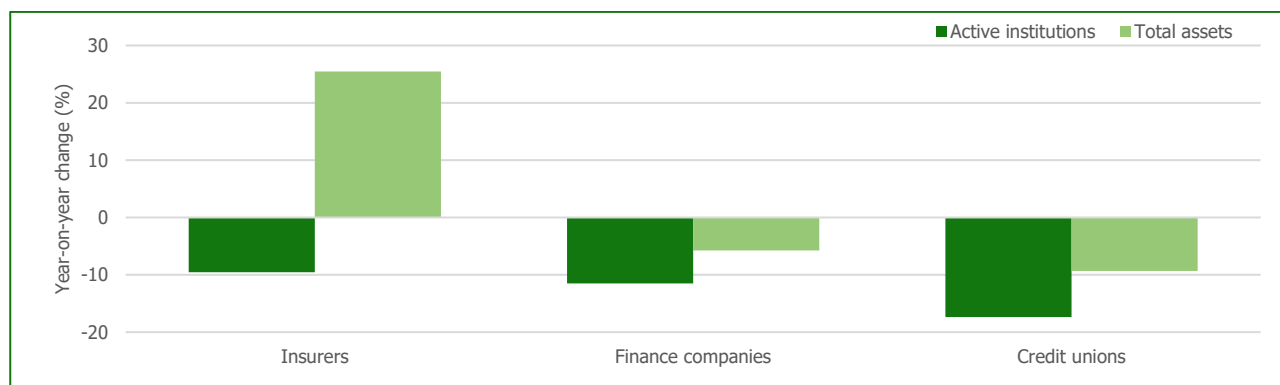


Figure 3. Selected financial indicators: Q1 2026 versus Q1 2025. Note: Values are Q1 year-on-year changes; the guarantee-volume change reflects a low-base effect. (Source: authors' calculations based on official NBU Q1 data)

Comparison of the Baseline and Early Post-Reform Periods

Table 4 compares period averages for 2021-2023 and 2024-2025. Average institution counts declined by 52.3% for insurers, 40.4% for finance companies, and 50.5% for credit unions. Average assets increased by 19.2% for insurers and 26.5% for finance companies but declined by 24.9% for credit unions. Average assets per institution increased by 143.2%, 101.9%, and 48.5%, respectively. These are descriptive period comparisons and do not identify causal effects.

Table 4. Calculated prudential and structural indicators by segment. Note: Baseline/post comparisons use 2021-2023 and 2024-2025. Aggregate ratios are descriptive unless a cited regulation states otherwise.

Segment	Indicator	Base	Comparison	Result	Unit
Insurers	Institutions, 2021-25	155	57	-63.226	%
Insurers	Assets, 2021-25	64.737	93.861	44.989	%
Finance companies	Institutions, 2021-25	922	411	-55.423	%
Finance companies	Assets, 2021-25	216.406	288.692	33.403	%
Credit unions	Institutions, 2021-25	278	85	-69.424	%
Credit unions	Assets, 2021-25	2.33	1.249	-46.393	%
Insurers	Avg. institutions: baseline/post	128	61	-52.344	%
Insurers	Avg. assets: baseline/post	69.816	83.196	19.165	%
Insurers	Avg. assets/institution	0.568	1.381	143.235	%
Finance companies	Avg. institutions: baseline/post	747	445	-40.428	%
Finance companies	Avg. assets: baseline/post	236.952	299.716	26.488	%
Finance companies	Avg. assets/institution	0.335	0.676	101.904	%
Credit unions	Avg. institutions: baseline/post	191	94.5	-50.524	%
Credit unions	Avg. assets: baseline/post	1.734	1.303	-24.855	%
Credit unions	Avg. assets/institution	0.009	0.014	48.499	%
Insurers	Avg. profit: 2022-23/post	2900.061	5398.318	86.145	%
Finance companies	Avg. profit: 2022-23/post	5183.208	12815.903	147.258	%
Credit unions	Avg. profit: 2022-23/post	-17.004	24.35	41.354	UAH million
Finance companies	Equity growth	44.15	142.977	223.841	%
Finance companies	Equity/assets change	20.402	49.526	29.124	pp
Credit unions	Loan portfolio change	2.015	0.999	-50.405	%
Credit unions	NPL from 2022 peak	0.385	0.294	-9.1	pp
Insurers	Asset share, 2025	383.802	93.861	24.456	%
Finance companies	Asset share, 2025	383.802	288.692	75.219	%
Credit unions	Asset share, 2025	383.802	1.249	0.325	%
Insurers	Asset share, Q1 2026	387.038	96.49	24.93	%
Finance companies	Asset share, Q1 2026	387.038	289.348	74.76	%
Credit unions	Asset share, Q1 2026	387.038	1.2	0.31	%

Regulatory Structure of Compliance Requirements

The author-verified coding covers 22 regulatory requirements. Governance is the primary code for 10 requirements (45.5%), legal obligations for eight (36.4%), FIN for three (13.6%), and DIG for one (4.5%). PROF has no primary classifications but appears as a secondary code in five requirements. Table 5 and Figure 4 report the primary and nonexclusive frequencies.

Table 5. Author-verified regulatory coding distribution. (Source: author-verified regulatory coding. Primary shares and nonexclusive frequencies are distinct and should not be added)

Item	Scope/combination	Primary n (%)	Nonexclusive / count
FIN	Capital; liquidity; assets; solvency	3 (13.636%)	10
DIG	Reporting; RegTech; data; cyber	1 (4.545%)	8
LEG	Authorization; duties; inspections	8 (36.364%)	14
GOV	Governance; risk; compliance; audit	10 (45.455%)	17
PROF	Fit and proper; competence; CPD	0 (0%)	5
Combination	GOV+LEG		5
Combination	DIG+FIN+LEG		4
Combination	FIN+GOV		3
Combination	FIN+GOV+LEG		2
Combination	GOV+PROF		2
Combination	DIG+GOV		1
Combination	DIG+GOV+LEG		1
Combination	DIG+GOV+PROF		1
Combination	DIG+LEG		1
Combination	FIN+GOV+PROF		1
Combination	GOV+LEG+PROF		1

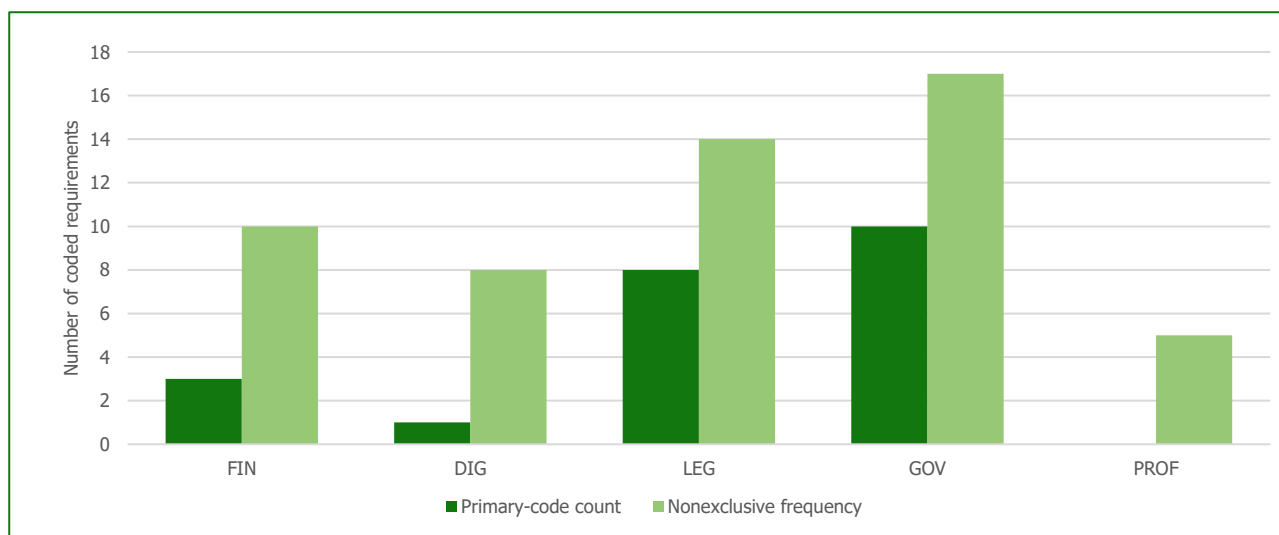


Figure 4. Author-verified regulatory requirements by FIN, DIG, LEG, GOV, and PROF. (Source: author-verified regulatory coding)

All 22 requirements received multiple codes. The most frequent combinations were GOV+LEG (5), DIG+FIN+LEG (4), FIN+GOV (3), FIN+GOV+LEG (2), and GOV+PROF (2).

Comparative Continuing Professional Development Findings

Table 6 compares Ukraine, the NASAA IAR model, the IRS enrolled-agent regime, and the EU IDD. The reviewed Ukrainian sources specify role-based competence and fit-and-proper requirements but no universal quantified minimum across all three segments. NASAA requires 12 credits annually; the IRS requires 72 hours over three years, including at least 16 hours and two ethics hours annually; and the IDD requires at least 15 hours annually for relevant insurance-distribution personnel.

Table 6. Comparative CPD and ongoing competence frameworks. (Source: official Ukrainian legal/NBU sources, NASAA materials, IRS guidance, and Directive (EU) 2016/97. Foreign frameworks are comparative benchmarks, not Ukrainian requirements)

Criterion	Ukraine	NASAA IAR	IRS enrolled agents	EU IDD	Ukrainian implication
Coverage	Role-specific fit and proper	Registered IARs	Enrolled agents	Insurance distributors	Differentiate by role/segment
Cycle	No universal cycle	Annual	Three years + annual minimum	Annual	Hybrid architecture
Minimum	No universal minimum	12 credits/year	72 hours/3 years; 16/year	15 hours/year	Do not copy mechanically
Ethics	Role-specific	6 ethics credits	2 ethics hours/year	Professional competence	Common ethics baseline
Records/oversight	Institution/NBU evidence	Provider and IAR records	IRS/provider records	Member-State control	Electronic CPD register
Noncompliance	Governance/authorization measures	Inactive status	Renewal/status risk	National sanctions	Fit-and-proper remediation
Transferability	Domestic baseline	Moderate: finance/customer roles	Limited: ethics/records	High for insurance distribution	Proportionate modules

Integrated Conceptual Framework

The conceptual synthesis produced a five-component framework linking financial-prudential assessment, digital monitoring, internal legal implementation, governance, and professional competence. Figure 5 presents the framework and its segment-adaptation layer.

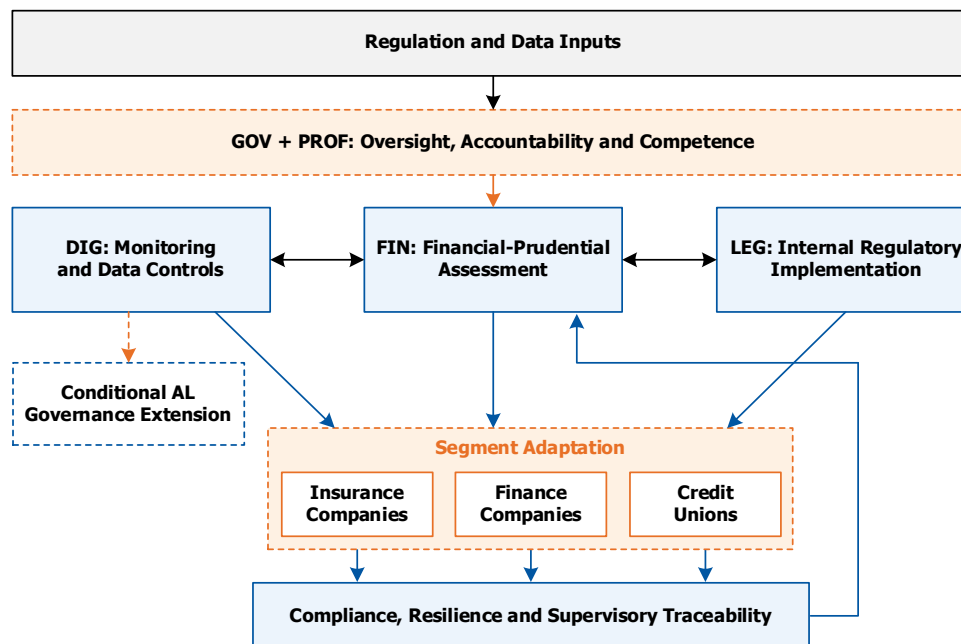


Figure 5. Integrated financial, digital and legal framework for NBF1 regulatory compliance. Note: The arrows represent information and control flows rather than causal effects. The AI governance extension is conditional and applies only where AI-enabled or autonomous workflows are used. (Source: developed by the authors based on official NBU data, author-verified regulatory coding, comparative CPD analysis, and the conceptual synthesis conducted in this study)

The framework contains a financial-prudential core, digital and legal implementation components, a cross-cutting governance and competence layer, three segment profiles, and a feedback path from supervisory outcomes to financial assessment.

Segment-Specific Prudential Implications

The synthesis of the financial evidence and regulatory coding identifies different prudential priorities for the three segments. For insurers, asset growth must be assessed together with solvency, technical reserves, reserve-covering assets, claims, investment concentration, asset-liability management, actuarial reporting, and governance. For finance companies,

rising equity and changing credit, factoring, leasing, guarantee, and acquired-debt portfolios increase the relevance of minimum capital, asset quality, counterparty exposure, related-party governance

and service concentration. For credit unions, contraction in assets and the loan portfolio, together with an NPL ratio above the 2021 level, supports proportionate attention to liquidity, member deposits, loan quality, cooperative governance and member protection.

Across the three segments, consolidation creates three prudential risks. The first is higher concentration and increased supervisory significance of a smaller number of institutions. The second is increased interconnectedness and counterparty concentration, including banking and related-party exposures. The third is greater operational, governance and risk-management complexity within larger surviving institutions. Consumer and member protection remains a cross-cutting conduct risk where consolidation is not accompanied by stronger complaint-handling and governance controls.

Practical Implementation Mechanisms

The framework operationalizes the empirical and regulatory findings through six implementation blocks. Financial-prudential monitoring covers capital, solvency, asset quality, valuation, liquidity, concentration, counterparty exposure and stress testing. Binding thresholds follow applicable regulation, while additional triggers should be institution-specific limits approved within the risk-appetite framework.

Legal and regulatory implementation uses a regulatory inventory, obligation matrix, assigned owners, reporting controls, change monitoring, evidence retention and remediation tracking. Governance and internal control connect board oversight, risk management, compliance, internal audit and AML/CFT governance to challenge, escalation and closure of material issues.

Professional competence links initial, periodic and event-driven fit-and-proper reviews to ethics, conflicts of interest, documented CPD and remediation. Digital monitoring uses data reconciliation, regulatory reporting, digital treasury, dashboards and early-warning alerts to support traceability and timely response. Conditional AI governance applies only where AI-enabled or autonomous workflows are used and preserves human approval, escalation, override, rollback, suspension and auditability.

Table 7 summarizes the segment-specific application of these six implementation blocks.

Table 7. Segment-specific implementation matrix for NBFIs regulatory compliance. (Source: developed by the authors from the financial analysis, regulatory coding, and comparative CPD findings)

Mechanism	Insurers	Finance companies	Credit unions	Digital/governance support
Financial-prudential monitoring	Solvency; reserves; asset-liability management; claims	Capital; loans; factoring; leasing	Capital; liquidity; deposits; NPLs	Board; risk; alerts; stress tests
Legal/regulatory implementation	Insurance obligations; reporting	Authorization; service rules	Credit-union duties; member protection	Compliance; obligation matrix; remediation
Governance/internal control	Actuarial; risk; audit	Risk; compliance; related parties	Cooperative governance; controls	Board oversight; audit trail
Professional competence	Fit and proper; IDD-informed CPD	Role-based CPD; conduct	Proportionate CPD; member focus	HR; compliance; CPD register
Digital monitoring	Reserve/claims dashboards; treasury	Capital/service alerts; treasury	Liquidity/NPL dashboards	Data validation; reporting; early warning
Conditional AI governance	AI use cases only	AI use cases only	AI use cases only	Human override; auditability

Conditional AI Governance Architecture

As a light extension of the digital block, the integrated model may include an Invariance-based AI governance layer for cases where NBFIs use AI-enabled RegTech, automated financial monitoring, digital treasury, or agentic financial processes. This layer does not replace the five-block compliance model; rather, it operationalizes the digital block by translating legal, financial-prudential, institutional, professional, and cyber-resilience requirements into invariant conditions and machine-speed supervisory signals.

The methodology is Kateryna Shcheglova's original personal development, registered as the scientific work "Methodology for Invariant AI Risk Management through a Distributed Consensus Mechanism in Agentic and Autonomous Financial Ecosystems" under Certificate of Copyright Registration No. 149303 (Shcheglova, 2026).

It is not an NBU requirement, is not part of the regulatory coding, and is not empirically validated by the financial analysis conducted in this study.

The architecture of the methodology is summarized in Table 8.

Table 8. Invariance-based AI governance through distributed risk consensus extension of the digital compliance block. (Source: adapted from Shcheglova (2026))

Layer/element	Regulatory compliance function	Key risk addressed	Practical implementation tool
Invariant Library	Translates legal, financial, prudential, conduct, data, and resilience requirements into stable boundaries of permissible AI autonomy	Breach of regulatory, financial, consumer-protection, cyber, or operational thresholds	Library of invariants, prohibited states, thresholds, and evidence requirements
Sentinel Layer	Monitors domain-specific compliance of AI-enabled processes at machine speed	Domain-specific Sentinel monitoring, which may be implemented through independent or differently architected control components, reduces the risk of simultaneous manipulation across all domains and minimizes delayed detection of drift, bias, hallucinations, cyber manipulation, liquidity or conduct deviations, as well as loss of fair value, consumer understanding or contestability	Financial, Compliance, Cyber, Operational Resilience, Conduct, and Ethics Sentinel signals; Conduct Sentinel with consumer-outcome, fair-value, consumer-understanding, contestability, and human-override signals
Risk-Consensus Layer	Aggregates Sentinel signals and forms a coordinated risk status for escalation or restriction of autonomy	Incorrect aggregation or weighting of independent Sentinel signals, false consensus, delayed escalation, or failure to prioritize a critical domain breach	Distributed risk consensus, aggregation of independent domain-specific Sentinel signals, critical breach detection, and escalation logic
Human Governance Layer	Preserves board and management control over autonomy boundaries, override rights, escalation, suspension, and kill switch	Formal or ineffective human oversight over autonomous or AI-enabled processes	Risk committee approval, human review, override, rollback, kill switch, audit trail

Within this AI governance extension, the Conduct Sentinel is therefore not limited to checking whether a consumer received an explanation. It can monitor consumer-outcome and fair-value invariants inspired by the Consumer Duty, including absence of foreseeable harm, proportionality of the outcome, consumer understanding, contestability, protection from proxy discrimination, and the continued fairness of the decision under model drift and data drift.

These elements extend explainability from the technical description of an AI-supported decision to the continuous assessment of whether the resulting recommendation, price, limit, refusal, payment, or automated action remains fair, understandable, contestable, and subject to meaningful human intervention. The FCA Consumer Duty is used only as a methodological benchmark and does not create Ukrainian legal obligations. Institutional application would require separate testing, governance approval, evidence collection, and regulatory compatibility assessment.

DISCUSSION

Financial Consolidation and Market Structure

The principal finding - consolidation accompanied by divergent balance-sheet trajectories - is consistent with Aramonte et al. (2021) and the Financial Stability Board (2025), which connect NBFI vulnerabilities to liquidity, leverage, interconnectedness, and heterogeneous business models. Montagner (2025) similarly emphasizes transmission channels and regulatory challenges across non-bank institutions. The Ukrainian evidence adds a three-segment comparison: institution numbers fell throughout the market, but asset growth among insurers and finance companies contrasted with contraction among credit unions. This divergence shows why consolidation cannot be interpreted as a uniform improvement or deterioration in resilience.

The growth of finance companies also accords with evidence on changing intermediation channels. Buchak et al. (2018) linked the rise of FinTech and shadow banks to regulatory and technological change, while Gopal and Schnabl (2022) documented substitution by finance companies and FinTech lenders when bank small-business lending declined. Unlike those studies, the present analysis does not estimate substitution or causal effects; it contributes a prudential mapping of asset, equity and service-volume changes under the Ukrainian regulatory transition.

Segment-Specific Findings

For insurers, the combined emphasis on asset growth, solvency, reserve coverage and governance is consistent with Rae et al. (2018), who identified continuing Solvency II challenges in asset-liability management, liquidity and disclosure. Abernikhina et al. (2021) support the use of multiple interrelated stability indicators, and Ames et al. (2018) show that board risk committees are associated with insurer strength ratings and performance. The present study extends this literature by connecting the indicators to digital monitoring, legal obligations, and a segment-specific implementation matrix.

For finance companies, the findings support the receivables and counterparty emphasis identified by Klapper (2006) for factoring and the alternative-lending dynamics documented by Buchak et al. (2018) and Gopal and Schnabl (2022). Ukrainian leasing studies identify financing, market-development, asset-valuation, and residual-value dimensions. The present contribution is to integrate these activity-specific risks with capital, related-party governance, service concentration and regulatory reporting within one finance-company compliance profile.

For credit unions, the contraction of assets and loan portfolios and the persistence of elevated NPLs are consistent with the governance and sustainability questions summarized by McKillop and Wilson (2011) and McKillop et al. (2020). El Fadil and Hessou (2024) further show the relevance of asset-liability composition to credit-union performance. The Ukrainian results add evidence for proportionate liquidity, deposit, loan-quality, and member-protection controls rather than direct transplantation of insurer or finance-company mechanisms.

Integrated Compliance Framework

The framework's digital component is consistent with Arner et al. (2017), Buckley et al. (2020) and Butler and O'Brien (2019), who describe RegTech as a data-centered reorganization of regulatory compliance rather than simple digitization. Its governance layer is consistent with Stulz (2016), Aebi et al. (2012) and Ellul and Yerramilli (2013), whose findings emphasize risk culture, independent risk controls and board-level reporting. The specific contribution of the present study is to connect these strands through a traceable sequence from financial indicator to digital signal, governance response, legal remediation, and reporting, while retaining segment adaptation.

The author-verified coding reinforces this integration. Governance and legal obligations dominate the primary-code distribution, whereas FIN remains the evidence-based core because it contains the measurable conditions to which monitoring and remediation respond. Multiple coding across all selected requirements indicates that the five components are interdependent, but the coding frequencies are structural descriptors rather than measures of legal importance.

Professional Suitability and Continuing Professional Development

The hybrid CPD architecture is consistent with De Lange et al. (2015), whose survey showed both convergence in professional-development expectations and persistent heterogeneity in practice. NASAA, IRS and IDD rules demonstrate possible cycles, ethics components, recordkeeping and consequences for noncompliance. The present study differs by avoiding mechanical transfer of foreign hour requirements and instead linking a common baseline to institutional significance, role, risk profile, and fit-and-proper assessment.

AI Governance

The integration of Shcheglova's Invariance-based AI Governance through Distributed Risk Consensus methodology adds an AI governance perspective to this digitalization logic. It is particularly relevant where RegTech or digital treasury evolves from passive analytics to agentic or semi-autonomous decision support. In such cases, compliance should be assessed not only through ex post reporting, but also through continuous monitoring of invariant conditions, Sentinel-domain signals, distributed risk consensus, and human-governed autonomy boundaries.

This positioning is consistent with Rudin's (2019) concern that high-stakes decisions require interpretable and governable systems, Bussmann et al.'s (2021) integration of explanation with financial risk analysis, Kroll et al.'s (2017) emphasis on technical and institutional accountability, and Fritz-Morgenthal et al.'s (2022) risk-based testing and production governance for trustworthy and auditable financial AI. Shcheglova's distinctive contribution is to connect these concerns through an Invariant Library, domain-specific Sentinels, distributed risk consensus, and explicit human authority over autonomy boundaries.

The Consumer Duty-inspired element is especially relevant for agentic AI because autonomous systems may preserve a formally explainable process while the outcome gradually becomes unfair or loses fair value. Model drift, data drift, changing behavioral data, proxy discrimination, and dynamic optimization may affect prices, limits, recommendations, refusals, or automated payments over time. For this reason, the Conduct Sentinel should be understood as an outcome-oriented supervisory function that connects explainability with fair value, consumer understanding, contestability, and meaningful human override. The FCA Consumer Duty is used only as a methodological benchmark; the methodology is not an NBU requirement, and institutional implementation requires separate testing, governance approval, evidence collection, and regulatory compatibility assessment.

Limitations

The analysis uses aggregated open NBU data and cannot identify institution-level distributions or causal effects. Reporting-method changes, market exits, the wartime shock, and the short post-2024 observation window restrict comparability. Some financial ratios could not be calculated consistently across all segments. International CPD benchmarks have different professional scopes, and the AI governance extension remains conceptual. Future research should use institution-level data where available, test the practical mechanisms in specific NBFIs, evaluate digital treasury and early-warning controls, and assess the AI governance extension in concrete reporting, financial-monitoring and conduct-risk use cases.

CONCLUSIONS

1. The 2021-2025 analysis identifies consolidation in all three segments, but the balance-sheet trajectories differ: aggregate assets increased among insurers and finance companies and contracted among credit unions. This divergence is the study's central empirical result.
2. The Q1 2026 versus Q1 2025 comparison confirms that the latest observed changes were also segment-specific: insurer assets and profits increased, finance-company assets declined while equity and selected service volumes grew, and credit-union assets and deposits contracted while the financial result improved.
3. The segment analysis identifies concentration and supervisory significance, interconnectedness and counterparty concentration, and operational, governance and risk-management complexity as the principal prudential implications of consolidation. Insurers require solvency and reserve-related controls, finance companies require capital and portfolio controls, and credit unions require proportionate liquidity, deposit and loan-quality controls.
4. The author-verified FIN-DIG-LEG-GOV-PROF coding covers 22 regulatory requirements. Governance and legal obligations dominate the primary-code structure, while multiple coding of all selected requirements confirms structural interdependence across financial, digital, legal, governance, and professional components.
5. The comparative analysis of Ukraine, the NASAA IAR model, the IRS enrolled-agent regime and the EU Insurance Distribution Directive supports a hybrid CPD architecture: a modest common baseline combined with institution-specific modules linked to significance, role, risk profile and fit-and-proper assessment.
6. The study establishes a functional connection between financial indicators, digital monitoring, governance response and legal implementation. Financial deterioration or control exceptions generate signals, escalation, and evidence that can support remediation and supervisory reporting.
7. The integrated conceptual framework places financial-prudential assessment at the evidence-based core, uses digital mechanisms for monitoring and traceability, translates external rules through internal legal implementation, and treats governance and professional competence as cross-cutting layers with feedback from supervisory outcomes.
8. The segment-specific implementation matrix translates the common framework into differentiated recommendations for insurers, finance companies and credit unions. This approach supports proportional implementation rather than a uniform compliance template for all NBFIs.
9. Kateryna Shcheglova's copyright-registered Invariance-based AI Governance through Distributed Risk Consensus methodology is positioned as a conditional extension of the digital block for AI-enabled or autonomous workflows. It translates applicable legal, financial-prudential, conduct, data, and resilience requirements into invariant conditions, combines domain-specific Sentinel monitoring with distributed risk consensus, and preserves human-governed autonomy boundaries through escalation, override, rollback, suspension, and kill-switch mechanisms. It is not an NBU requirement, is not part of the regulatory coding, has not been empirically validated by this financial analysis, and requires separate institutional testing and regulatory compatibility assessment.

10. The findings should be interpreted within the limitations of aggregated data, reporting changes, market exits, the wartime environment, and the short early post-reform period. Future research should apply institution-level evidence, test the proposed mechanisms in specific segments, and evaluate digital and AI-governance controls in operational settings.

ADDITIONAL INFORMATION

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CONFLICT OF INTEREST

The Authors declare that there is no conflict of interest.

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ФІНАНСОВІ, ЦИФРОВІ ТА ПРАВОВІ МЕХАНІЗМИ ЗАБЕЗПЕЧЕННЯ РЕГУЛЯТОРНОЇ ВІДПОВІДНОСТІ В НЕБАНКІВСЬКИХ ФІНАНСОВИХ УСТАНОВАХ

Перехід України до ризик-орієнтованого пруденційного нагляду потребує поєднання формальних регуляторних вимог до небанківських фінансових установ із вимірюваною фінансовою стійкістю, надійними даними, якісним управлінням і професійною компетентністю. Метою дослідження є оцінювання фінансової трансформації та регуляторної відповідності окремих сегментів небанківських фінансових установ України, систематизація застосованих регуляторних вимог і розробка інтегрованої моделі, що поєднує фінансові, цифрові, правові, управлінські та професійні механізми. Аналіз ґрунтується на офіційних даних Національного банку України щодо страхових компаній, фінансових

компаній і кредитних спілок; описовому порівнянні періодів, авторськи верифікованому кодуванні нормативних вимог і порівняльному аналізі підходів до безперервного професійного розвитку. Результати засвідчили консолідацію в усіх трьох сегментах за різноспрямованою динамікою балансів: сукупні активи страховиків і фінансових компаній зросли, водночас активи кредитних спілок скоротилися. У структурі первинних кодів переважають вимоги корпоративного управління та правові зобов'язання, а множинне кодування підтверджує взаємозалежність фінансових, цифрових, правових, управлінських і професійних компонентів. Запропонована фінансово орієнтована концептуальна модель визначає пруденційне оцінювання як доказове ядро, цифрові засоби – як інструменти моніторингу й простежуваності, правові механізми – як спосіб трансформації зовнішніх вимог у внутрішні обов'язки, а корпоративне управління та професійну компетентність – як наскрізні рівні. Результати обґрунтовують диференційований, а не уніфікований підхід до регуляторної відповідності та можуть бути корисні Національному банкові України, небанківським фінансовим установам; функціям комплаєнсу, ризик-менеджменту й внутрішнього аудиту; професійним об'єднанням, дослідникам і фахівцям із формування політики.

Ключові слова: небанківські фінансові установи, регуляторна відповідність, пруденційний нагляд, консолідація ринку, фінансова стійкість, якість активів, RegTech, корпоративне управління, безперервний професійний розвиток, управління ШІ

JEL Класифікація: G23, G28, G32, M42, O33