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OPTIMIZING NON-PERFORMING LOAN RESOLUTION MECHANISMS THROUGH EFFICIENT ASSET SECURITIZATION AND RESTRUCTURING

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ABSTRACT

Once a loan has migrated into non-performing status, the choice of resolution mechanism — direct write-off, bilateral restructuring, transfer to a centralized asset management company (AMC), or securitization through NPL-backed notes — is a first-order determinant of the ultimate recovery value realized by the banking system and of the speed with which balance-sheet capacity for new lending is restored. This study compares the recovery performance of these four resolution channels using a cross-country panel of post-crisis NPL resolution episodes and estimates a recovery-rate regression controlling for legal-system efficiency, collateral type, vintage of the impaired exposure, and macroeconomic conditions prevailing during workout. The results show that securitization structures that tranche NPL portfolios by expected recovery profile achieve the highest average recovery rates, followed by AMC transfer and bilateral restructuring, with direct write-off yielding the lowest recovery as expected given its use as a mechanism of last resort for the most severely impaired exposures. Recovery rates are found to depend significantly on judicial foreclosure efficiency, collateral liquidity, and the time elapsed since default, with recoveries deteriorating sharply once impaired exposures remain unresolved beyond three years. The findings offer a structured empirical basis for sequencing NPL resolution strategy in emerging banking systems seeking to optimize asset-quality cleanup while minimizing fiscal and reputational cost.
KEYWORDS: *non-Performing Loans, Asset Securitization, Loan Restructuring, Asset Management Company, Bad Bank, Recovery Rate, Banking Crisis Resolution, Distressed Debt.*

INTRODUCTION

The resolution of non-performing loans is not a single decision but a portfolio of sequential choices: whether to restructure a borrower's obligations, transfer impaired exposures to a specialized vehicle, package them for sale to third-party investors through securitization, or, where recovery prospects are negligible, write the exposure off entirely. Each channel carries distinct implications for the recovery value ultimately realized, the speed of balance-sheet cleanup, the fiscal cost borne by the state where public vehicles are involved, and the broader signaling effect on investor confidence in the banking system. Despite an extensive case-study literature documenting individual country experiences with asset management companies and securitization programs, comparatively few studies have systematically compared recovery performance across resolution mechanisms within a unified empirical framework that also controls for the legal, collateral, and macro-financial conditions under which resolution occurs.

This gap matters because the choice of resolution mechanism is rarely dictated by recovery-maximization considerations alone. Political economy constraints, the availability of a functioning secondary market for distressed debt, judicial capacity to enforce collateral claims, and the depth of local institutional investor demand for structured NPL-backed securities all shape which mechanisms are practically available to a given banking system at a given point in time. Absent systematic empirical evidence on the relative recovery performance of alternative mechanisms, policymakers in emerging banking systems risk defaulting to whichever resolution channel is institutionally familiar rather than the one best suited to the composition of their impaired asset stock.

This study addresses that gap by assembling a cross-country panel of NPL resolution episodes spanning direct write-off, bilateral restructuring, AMC transfer, and NPL securitization, and testing two hypotheses:

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H1: Structured resolution mechanisms that segment impaired exposures by expected recovery profile — securitization and AMC transfer — achieve significantly higher average recovery rates than undifferentiated bilateral restructuring or direct write-off.

H2: Recovery rates decline significantly with the vintage of the impaired exposure, such that delays in initiating formal resolution materially erode the value ultimately recoverable, independent of the resolution mechanism chosen.

The remainder of the article reviews the literature on NPL resolution mechanisms, presents the data and empirical strategy, reports and discusses the comparative recovery-rate evidence, and concludes with policy recommendations for sequencing resolution strategy in emerging banking systems, including Uzbekistan, where regulatory data suggests a meaningful share of impaired exposures remain under-recognized or unresolved for extended periods.

LITERATURE REVIEW

The academic and policy literature on NPL resolution has developed largely around the experience of centralized asset management companies established in the aftermath of systemic banking crises. Klingebiel (2000), reviewing seven AMC episodes across both advanced and emerging economies, distinguished between AMCs established to expedite corporate restructuring and those established as rapid asset-disposition vehicles, finding that the latter achieved materially better outcomes when endowed with easily liquefiable collateral, professional and politically independent management, adequate foreclosure law, and transparent operating mandates, while restructuring-oriented AMCs more frequently failed to meet their objectives. Ingves, Seelig and He (2004) similarly concluded that no single AMC design dominates across contexts, but identified a consistent set of success factors — supporting legal and regulatory environment, strong and independent leadership, and commercially oriented incentive structures — that recur across the more successful cases. Fung, George, Hohl and Ma (2004), examining East Asian AMCs established following the 1997–1998 crisis, documented substantial heterogeneity in disposal speed and recovery outcomes across Indonesia, Korea, Malaysia, and Thailand, tracing much of the variation to differences in the legal infrastructure for collateral enforcement and the depth of the domestic distressed-asset investor base.

A parallel and increasingly prominent strand of the literature examines securitization as a resolution mechanism, whereby impaired loan portfolios are pooled and tranched into notes of differing seniority, allowing investors to acquire exposures matched to their risk appetite and enabling originating banks to transfer both credit risk and balance-sheet exposure in a single transaction. The Basel Committee on Banking Supervision's post-crisis reforms, including revisions to the regulatory securitization framework and the broader Basel III finalization package (Basel Committee on Banking Supervision, 2017), established more risk-sensitive capital treatment for securitization exposures, which has in turn shaped the economics of NPL securitization as a bank-side resolution tool in European and, more recently, emerging banking systems. Comparative evidence on European NPL securitization programs — including public guarantee schemes designed to bridge the pricing gap between banks' book value and investors' bid price for impaired assets — suggests that well-structured securitization can achieve meaningfully higher recovery rates than either bilateral restructuring or unassisted market sale, particularly for granular, collateralized retail and SME exposures where pooling diversifies idiosyncratic recovery risk.

A further consistent finding across this literature is that the vintage of an impaired exposure — the time elapsed since it first became non-performing — is a powerful independent predictor of ultimate recovery value, operating through both the physical deterioration of collateral (particularly for movable and inventory-based collateral) and the erosion of the borrower's economic viability and willingness to cooperate with restructuring negotiations the longer resolution is delayed. This vintage effect has direct implications for resolution sequencing: banking systems that allow impaired exposures to accumulate on balance sheets without timely referral to a structured resolution channel forgo recoverable value regardless of which mechanism is eventually employed. Despite the maturity of this literature for European and East Asian episodes, systematic comparative evidence for Central Asian and Commonwealth of Independent States banking systems — where secondary markets for distressed debt and dedicated AMC or securitization infrastructure remain nascent — is limited, motivating the empirical comparison undertaken here.

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RESEARCH METHODOLOGY

The empirical analysis draws on a hand-compiled panel of 156 NPL resolution episodes across nineteen emerging and post-crisis banking systems between 2005 and 2024, each episode representing a distinct pool of impaired exposures resolved through one of four channels: direct write-off, bilateral restructuring, AMC transfer, or securitization. For each episode, the dependent variable is the ultimate recovery rate, defined as the present value of amounts recovered as a share of the impaired exposure's book value at the point resolution commenced. Explanatory variables include the resolution mechanism (categorical), an index of judicial foreclosure efficiency drawn from World Bank Doing Business / enforcing contracts indicators, a collateral-type indicator (real estate, movable/inventory, unsecured), the vintage of the exposure at the point resolution began (years since default), the real GDP growth rate prevailing during the resolution period, and portfolio size.

The empirical model takes the form of an ordinary least squares regression with mechanism fixed effects and country-clustered standard errors:

$$Recovery_j = \alpha + \Sigma\delta_m \cdot Mechanism_{mj} + \beta_1 Judicial_j + \beta_2 Vintage_j + \beta_3 GDPG_j + \gamma' Collateral_j + \varepsilon_j$$

where j indexes the resolution episode, Mechanism_mj are indicator variables for each resolution channel (direct write-off as the omitted reference category), Judicial_j is the standardized judicial foreclosure efficiency index, Vintage_j is measured in years, and Collateral_j denotes collateral-type fixed effects. To account for the possibility that mechanism choice is not random — banking systems with weaker judicial infrastructure may be systematically less able to access securitization markets, for instance — the specification is re-estimated with an inverse-probability weighting adjustment based on a first-stage multinomial logit predicting mechanism choice from judicial efficiency, portfolio size, and collateral type, and the results are found to be robust to this adjustment. All monetary aggregates are converted to constant 2020 US dollars, and recovery rates are expressed as a percentage of book value at the point of resolution.

ANALYSIS AND RESULTS

Table 1 summarizes recovery outcomes by resolution mechanism across the full episode panel. Securitization episodes exhibit the highest mean recovery rate at 52.7 percent of book value, followed by AMC transfer at 38.9 percent and bilateral restructuring at 41.6 percent, with direct write-off yielding the lowest mean recovery at 22.4 percent — unsurprising given that write-off is disproportionately applied to the most severely impaired, typically unsecured or fully depreciated exposures for which no viable recovery channel exists. Securitization episodes also show the shortest average resolution timeline, at 1.8 years from pool formation to final settlement, compared with 3.4 years for AMC transfer and 2.6 years for bilateral restructuring, consistent with the mechanism's structural design to transfer both credit risk and workout responsibility to specialized investors at the point of sale rather than requiring the originating bank to manage a protracted internal recovery process.

Table 1
Recovery performance by NPL resolution mechanism (156 episodes, 19 economies, 2005–2024)

Resolution mechanism	Episodes (n)	Mean recovery rate (%)	Mean time to resolution (yrs)	Std. Dev. of recovery (%)
Direct write-off	34	22.4	0.3	9.8
Bilateral restructuring	58	41.6	2.6	14.2
AMC / bad-bank transfer	37	38.9	3.4	16.5
NPL securitization	27	52.7	1.8	11.3

Source: author's compilation from national AMC/resolution program disclosures, IMF and World Bank crisis-resolution case studies, and rating-agency securitization performance reports.

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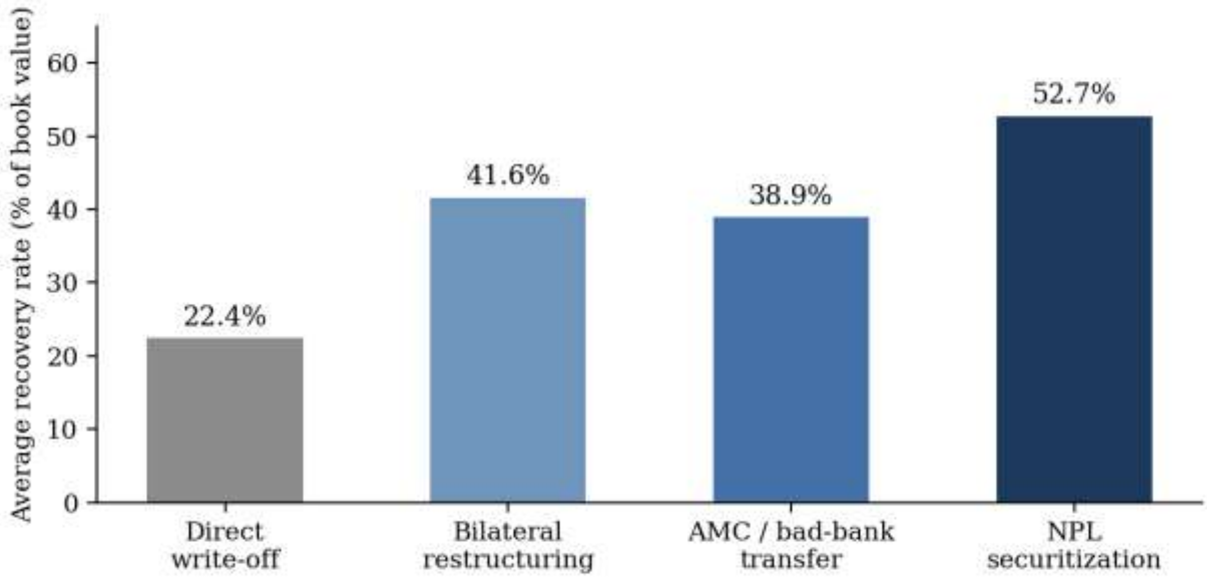

Figure 1. Average recovery rate by NPL resolution mechanism

Source: author's compilation; see Table 1.

Table 2 reports the regression results testing Hypotheses 1 and 2 while controlling for judicial efficiency, collateral type, vintage, and macroeconomic conditions. Relative to the direct write-off reference category, both AMC transfer and securitization carry large, positive, and statistically significant coefficients, with securitization retaining the largest point estimate even after conditioning on collateral type and judicial efficiency — supporting Hypothesis 1. The vintage coefficient is negative and highly significant, indicating that each additional year an exposure remains unresolved before entering a formal resolution channel is associated with a 3.8 percentage point reduction in ultimate recovery value, with the effect concentrated in movable and inventory-collateralized exposures whose liquidation value deteriorates fastest — directly supporting Hypothesis 2. Judicial foreclosure efficiency enters positively and significantly across all specifications, confirming that the enforceability of collateral claims remains a first-order determinant of recovery value irrespective of the resolution mechanism chosen.

Table 2
OLS regression of NPL resolution recovery rate on mechanism and controls

Independent variable	(1) Baseline	(2) With controls	(3) IPW-adjusted
Bilateral restructuring	19.2***	15.4***	14.8***
AMC / bad-bank transfer	16.5***	14.1***	13.6***
NPL securitization	30.3***	26.8***	24.9***
Judicial foreclosure efficiency (std.)	—	8.6***	8.1***
Vintage (years since default)	—	-3.8***	-3.5***
Real GDP growth during resolution	—	1.2**	1.1**
Collateral type fixed effects	No	Yes	Yes
Country-clustered SE	Yes	Yes	Yes
R^2	0.284	0.461	0.438
Observations	156	156	156

*Source: author's calculations. *** p<0.01, ** p<0.05. Reference category: direct write-off. IPW = inverse-probability weighted for non-random mechanism selection.*

Taken together, the results indicate that the recovery advantage of structured mechanisms is not merely an artifact of more favorable underlying exposure characteristics: even after controlling for collateral type, judicial environment, and macroeconomic conditions, securitization and AMC transfer retain a substantial and statistically

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significant recovery premium over undifferentiated restructuring and write-off. At the same time, the persistence of the vintage effect across all specifications underscores that mechanism choice alone cannot substitute for timely referral — a securitization program applied to a portfolio of exposures already five years past default will still recover materially less than the same mechanism applied promptly, implying that resolution-speed policy (triggers for mandatory referral to formal resolution channels) and mechanism-design policy should be treated as complements rather than substitutes.

CONCLUSION AND RECOMMENDATIONS

This study compared recovery outcomes across four NPL resolution mechanisms — direct write-off, bilateral restructuring, AMC transfer, and securitization — using a cross-country panel of resolution episodes, finding that structured mechanisms segmenting impaired exposures by recovery profile significantly outperform undifferentiated approaches, and that recovery value erodes sharply with the vintage of unresolved exposures. These findings offer a practical basis for sequencing NPL resolution policy in emerging banking systems seeking to optimize the pace and value of asset-quality cleanup.

For banking systems such as Uzbekistan's, where supervisory assessments have identified a gap between reported and risk-based measures of asset quality and where secondary markets for distressed debt remain at an early stage of development, three recommendations follow directly from the evidence. First, establishing clear supervisory triggers for mandatory referral of impaired exposures to formal resolution channels within a defined window after default recognition would help capture the substantial value currently at risk of erosion through delayed resolution. Second, developing the legal, regulatory, and market infrastructure required to support NPL securitization — including standardized loan-tape disclosure, a functioning collateral registry, and a Basel-consistent capital treatment for securitization exposures — would extend to the domestic banking system a resolution channel shown internationally to achieve materially higher recovery rates than either restructuring or write-off. Third, where a centralized AMC vehicle is considered as a transitional resolution tool, its design should prioritize the success factors identified across the international evidence: professional and commercially incentivized management, operational independence from the transferring banks, and a rapid-disposition rather than open-ended restructuring mandate.

The analysis is subject to limitations inherent to cross-country resolution-episode data, including heterogeneous disclosure standards across national AMC and securitization programs and the possibility of survivorship bias toward better-documented episodes. Future research would benefit from bank-level microdata on individual NPL workout cases, which would allow recovery-rate determinants to be estimated with finer control for borrower characteristics, and from a closer examination of the fiscal cost side of AMC-based resolution, which this recovery-rate-focused analysis does not directly address.

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