An Application of Credit Scoring Under the Stress of Military Conflict: The Case Study of Ukraine, Continuation (2025)

Osipenko Denys, PhD

Chief Data Analytics Officer, Wing Bank (Cambodia); Associate, the University of Edinbrugh Business School.

Since 2022, Ukrainian businesses have faced severe socio-economic and operational disruptions due to military conflict, including the destruction of logistics chains, infrastructure damage, and financial instability. In response, Ukrainian banks have emphasized the need for adaptive risk management strategies, regulatory support, and their impact on credit risk modeling in war-affected economies.

In 2023, we initiated research on the resilience of credit risk management systems under wartime stress in Ukraine, conducting ongoing surveys with Ukrainian banks. Our findings reveal shifts in credit portfolio indicators and credit scoring metrics, highlighting dependencies between portfolio quality and risk assessment accuracy. Additionally, we have identified and classified adaptive credit control methods for portfolio management and stress-testing.

Our analysis of the probability of default estimation for 2021–2024 indicates that traditionally strong predictive features—such as positive credit history, developed regions, profitable businesses, and low-risk socio-economic profiles—have lost their predictive power. Furthermore, we have quantified the correlation between specific stress factors and credit risk model performance, observing that higher default rates correspond with lower short-term predictive accuracy.

We have systematized adaptive approaches in credit controls and stress-testing scenarios. Ukrainian banks demonstrated preparedness for crisis scenarios, leveraging strict credit policies, loan restructuring, cloud technologies, and AI-driven risk management. The banking system's resilience was largely enabled by prior COVID-19-driven process restructuring, digitalization, and remote service adoption. Additionally, borrowers exhibited responsible financial behavior when able to meet obligations.

Economic Factors. First, we identify and systematise the key economic and socio-psychological factors affecting individuals and businesses during periods of armed conflict, which directly and indirectly influence credit risk. Examples include disruptions in the supply of raw materials, destruction or damage to transport infrastructure, nationalisation or confiscation of property, and the evacuation or migration of employees, all of which elevate business risk. For individuals, factors such as threats to life and health, ethical dilemmas, psychological stress, and burnout reduce willingness and ability to repay debt. Declines in business activity reduce household income and impair repayment capacity. Consequently, adaptive measures such as asset and supply chain diversification, contingency planning, currency risk hedging, insurance, and digitalisation are essential.

Anti-crisis Actions and Controls. Second, we outline credit portfolio management practices adopted during military conflicts. Traditional anti-crisis approaches—such as the enforcement of strict lending policies, debt restructuring, and securing support from international

organisations—were observed across countries. In Ukraine, however, the adoption of digital technologies, cloud solutions, and artificial intelligence for decision-making and communication emerged as notable innovations. Survey results indicate that banks often suspended lending, ceased operations in or near conflict zones, and offered restructuring programmes.

Macroeconomic and Portfolio Dynamics. Third, we analyse the dynamics of credit portfolios at both the national banking system and individual bank levels. Initial stress following the onset of war led to a rise in non-performing loans (NPLs), although the deterioration was less severe than anticipated. Over the longer term, however, portfolio quality declined as the ongoing destruction of infrastructure exerted a persistent negative impact, despite partial economic adaptation.

Scoring Model Performance. Fourth, we assess changes in the predictive accuracy of credit scoring models—measured by AUC and KS statistics—for retail cards, cash loans, SME, and corporate portfolios. All models experienced a decline in predictive accuracy immediately following the onset of conflict, with partial recovery observed in some cases. This stabilisation may reflect changes in decision-making processes or the redevelopment of models on updated datasets. The correlation between AUC and the default rate increase was estimated at 0.8.

Scoring Model Stability. Fifth, we evaluate the stability of borrower populations and predictor variables used in credit scoring. Population Stability Index (PSI) values reached 30–40% in some cases, indicating substantial shifts. Information Value (IV) analysis revealed both increases and decreases across predictors, depending on segment and time frame, when comparing pre-war, early-war, and post-war (2–3 years) periods. Examples are provided for business and corporate credit ratings.

Risk Modelling Challenges. Finally, we identify and discuss the key challenges for credit risk modelling under the stress of military conflicts.These challenges arise from both external instability factors and internal adjustments in bank policies. In some cases, newly originated portfolios in corporate and SME segments may exhibit better performance than before the onset of conflict, largely due to significant tightening of credit policies. Although such portfolios often contain a low number of defaulted loans, this may not accurately reflect the overall market risk profile. Furthermore, pre-war credit histories tend to be less informative, as borrower behaviour varies substantially across regions and over time. Several traditional behavioural and demographic predictors display considerable instability, reducing their predictive power. Conversely, transactional variables—capturing real-time financial activity—emerge as the most robust and informative predictors in the conflict environment.

This research contributes to the classification and comparison of applied credit risk modeling techniques, credit controls, and stress-management strategies during armed conflict. It also offers recommendations for enhancing credit scoring and risk controls for banks and regulators operating in war-affected environments.