

Estimation of Probability of Defaults (PD)  
for Low-Default Portfolios: An Actuarial Approach

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## **Abstract:**

Global financial crises like the one recently experienced affect both large and small institutions. Today, when there is heightened need for enhanced risk management tools, some entities are unable to employ sophisticated mechanisms due to limited data availability. Moreover, from the Basel Committee on Banking Supervision's point of view via Basel II and Basel III, the internal ratings-based (IRB) approach requires institutions have some reliable estimates of default probabilities for each rating grade. Taking the work of previous researches a step further, this paper intends to propose a new dynamic mechanism for the risk management industry to calculate probabilities of default (PD). Through this, we calculate the realized probability of defaults and Bayesian estimates in the initial phase and then, using these estimates as inputs for the core model, we generate implied probability of default through actuarial estimation tools and different probability distributions. This mechanism is specialized to work best for low-default portfolios (LDPs). Furthermore, scenario testing is adopted to validate the model against any model-specific bias.

**Key Words:** *Probability of Defaults (PDs), Realized PDs, Bayesian Estimates, Probability Distributions*