CHAPTER 2 – LITERATURE REVIEW

2.1 Introduction

The monitoring of loan portfolios has long been a central concern in banking and finance, as it directly reflects both institutional stability and broader systemic resilience. Key Performance Indicators (KPIs) provide a structured framework for evaluating loan portfolio quality, profitability, growth and diversification. This literature review synthesizes prior research across four dimensions—credit risk indicators, profitability measures, portfolio growth and sustainability and loan distribution and diversification—highlighting the KPIs studied, the datasets employed, and the results obtained. By systematically mapping these elements, the review establishes a foundation for the thesis objective of calculating and benchmarking five core KPIs on the Lending Club dataset.

2.2 Credit Risk Indicators

Credit risk indicators remain the cornerstone of loan portfolio monitoring, with the Non-Performing Loan (NPL) ratio frequently used as a proxy for default rates. Mileris (2012) evaluates the NPL ratio and probability of default (PD) using data from 22 EU countries (2008–2010), finding that GDP growth reduces NPLs while unemployment and inflation increase them, with predictive models achieving ~98% accuracy. In a similar vein, Altintaş and Küçükkocaoğlu (2016) confirm the macroeconomic drivers of NPLs using Turkish BRSA data (2003–2010) within a CPV stress-testing framework, though they emphasize that uncorrected use of NPLs can underestimate risk, while adjusted simulations yield more realistic probabilities and higher capital requirements. In contrast to these macro-focused approaches, Harris, Khan, and Nissim (2014) propose the ExpectedRCL metric, based on U.S. FR Y-9C filings (1996–2012), showing it significantly outperforms traditional accounting measures in predicting realized losses, especially post-crisis. The supervisory perspective reinforces these findings: the EBA (2025) benchmarking exercise highlights PD and LGD as critical KPIs, with PD variability declining but LGD variation remaining high. This resonates with the IFC (2024) global study, which reports an average default rate of 4.1% across 3,680 counterparties (1986–2023) but highlights geographic heterogeneity, underscoring the contextual dependence of default-related KPIs. Complementing these large-scale analyses, Barua and Amin (2023) show that in Bangladesh, higher NPLs coincide with lower capital adequacy ratios, particularly in state-owned banks, thus linking credit risk KPIs directly with institutional resilience. Methodological innovations also enrich this field: Wilson (1998) demonstrates how concentration alters loss distributions using Moody's defaults (1970–1993), while Shahbeyk and Banihashemi (2024) apply stochastic recovery rates to

Tehran Stock Exchange firms, improving VaR/CVaR accuracy. Similarly, Barik and Chakrabarty (2023) confirm through simulations that PD, LGD, EL, and UL remain decision-critical in liquidity stress scenarios. Finally, Albanesi and Domossy (2021), using U.S. HMDA and Equifax data, situate default KPIs within the macro-financial transmission of monetary policy, showing that easing increases loan origination but deteriorates borrower quality. Taken together, these studies demonstrate that credit risk KPIs, whether macro-driven, model-based, or supervisory, provide complementary insights that reinforce their central role in loan portfolio assessment.

2.3 Profitability Indicators

Profitability KPIs link portfolio quality to institutional sustainability, with ROA and ROE among the most frequently examined measures. Wamalwa and Jagongo (2017), reviewing MFIs across East Africa and Asia, show that stricter screening improves ROA/ROE, while high NPLs reduce them. Consistent with this, Harelimana and Gasheja (2016) analyze Umwalimu SACCO in Rwanda (2010–2014), finding that lower PAR and stronger reserves increase profitability, whereas concentration in long-term mortgages reduces yield. In contrast, Carretta et al. (2024) shift the focus away from credit risk, showing that misconduct costs—identified through a systematic review of 57 studies—can reduce net income by up to a third, underscoring that profitability KPIs can be impaired by governance failures even without rising credit risk. Expanding the discussion to financial innovation, Jobst (2006) highlights that securitization reallocates risk, reduces funding costs, and can enhance ROE, though only under sound pricing assumptions. A forward-looking perspective is added by Yameen et al. (2024), who find through a review of 50 studies that green finance lowers funding costs and raises margins, improving ROA and ROE. Taken together, these studies demonstrate that while profitability KPIs are sensitive to credit risk, they are equally shaped by governance and innovation, situating them as integrative measures of institutional sustainability.

2.4 Portfolio Growth and Sustainability

Loan growth serves as both a KPI of expansion and a potential risk amplifier. Malit, Nelson, and Odhiambo (2023), using 12 Kenyan banks (2007–2017), show that innovations such as mobile banking boost loan uptake but reduce ROA/ROE, revealing a growth–profitability trade-off. Thiong'o, Matata, and Kamau (2024), analyzing 31 Kenyan banks (2011–2015), confirm this trade-off by showing that loan growth raises NPLs and reduces ROA, though stronger asset quality and capital adequacy mitigate the effect. Reinforcing this micro-level evidence, Komezusenge (2024) finds that in Rwanda SACCOs, loan growth contributes to expansion, but sustainability hinges on governance and recovery systems. In contrast, Albanesi and Domossy (2021) adopt a macro-financial

lens, showing through HMDA and Equifax data (2000–2016) that monetary easing increases loan origination but worsens borrower quality, whereas tightening reduces growth but improves resilience. Complementing these insights, interest rate margins are identified as growth-linked KPIs: Durrani et al. (2022), using EBA stress test and AnaCredit data, demonstrate that margins rise with expected loss, but unevenly across borrowers, while Drehmann, Sørensen, and Stringa (2006) show through a Bank of England framework that rate hikes initially raise defaults but eventually improve net interest income. Collectively, these studies suggest that loan growth is a double-edged KPI, requiring balance between expansion and long-term stability.

2.5 Loan Distribution and Diversification

Loan distribution and diversification KPIs assess the structural balance of portfolios against concentration and systemic shocks. Wilson (1998), using Moody's defaults (1970–1993), shows that concentrated portfolios produce skewed loss distributions, while diversification smooths outcomes but cannot eliminate systemic risk. Building on this, Carruthers and Makova (2018) apply bank-sourced benchmarks to assess sectoral distribution, showing that peer comparisons can identify overexposures and guide rebalancing. Consistent with this quantitative emphasis, Suganya and Paranitha (2025), analyzing nine Sri Lankan banks (2012–2023), find that higher HHI values correspond to higher portfolio risk, with outcomes differing across loan products. Extending the scope, Ramponi and Scarlatti (2025) highlight environmental diversification using EU loan exposures, showing that the green/brown loan mix materially affects PD, VaR, and systemic sensitivity. Complementary practice-oriented insights come from the IACPM (2023) white paper, which stresses concentration limits and sector caps, while Casolaro et al. (2024) show that open banking broadens credit allocation and enhances diversification. Taken together, these contributions underline that distribution KPIs—whether sectoral, geographic, or environmental—are indispensable for managing structural portfolio risk.

2.6 Conclusion

The reviewed literature establishes KPIs as essential tools for quantifying loan portfolio quality, profitability, growth, and diversification. Credit risk studies consistently validate default-related measures (NPLs, PD, LGD, Expected Loss) alongside capital adequacy as core indicators of resilience. Profitability KPIs such as ROA and ROE connect these risk dimensions to institutional performance, while governance and innovation introduce additional layers of influence. Loan growth emerges as a double-edged KPI, driving expansion but often at the cost of rising defaults and lower profitability unless paired with strong governance and capital buffers. Finally, distribution and diversification KPIs

capture concentration risks, whether sectoral, geographic, or environmental. Together, these strands of literature not only highlight the multifaceted nature of loan portfolio monitoring but also reveal their interdependence, as credit risk directly affects profitability, growth, and diversification outcomes. This thesis operationalizes five core KPIs—Default Rate, Average Loan Amount, Average Interest Rate, Portfolio Growth, and Loan Distribution by Grade—on the Lending Club dataset, bridging academic insights with a data-driven implementation through an end-to-end engineering pipeline and API exposure.