Model Governance and Strategic Roadmap: Chain Forward

This document formalizes the assumptions, monitoring framework, and development roadmap required to support the recommended **Risk-Based Pricing** strategy for the Chain Forward lending product.

1. Financial & Portfolio Assumptions

These fixed parameters underpin the Net Present Value (**NPV**) analysis and the critical **3.75%** break-even rate. They form the foundation of the overall risk strategy.

Key Assumptions

Parameter	Value	Rationale
Loan Principal (Average)	**$200 USD**	Standard short-term working capital amount for MSMEs.
Loss Given Default (LGD)	**80%**	Reflects high recovery costs and absence of collateral in unsecured MSME lending.
Monthly Operating Expenses (OPEX)	**$2.00 USD / borrower**	Based on Forward Fintech's preliminary operating structure.
Discount Rate (Cost of Capital)	**12% Annual (1% Monthly)**	Standard market cost of capital for high-growth FinTechs.
Investment Period	**36 Months**	Target payback period for the **$4.5M** upfront investment.

Break-Even Threshold

The most important risk metric is the **Break-Even Default Rate (3.75%)**, which sets the maximum allowable portfolio-level default rate.

$$\text{Break - Even DR} = \frac{(\text{Monthly Revenue} - \text{Monthly OPEX})}{(\text{Principal} \times \text{LGD})} = 3.75\%$$

2. Risk Management & Monitoring Framework (Phase 1)

This framework defines how to monitor the new Risk-Based Pricing strategy and the required checkpoints for early intervention.

A. Key Performance Indicators (KPIs)

Track monthly/weekly to evaluate portfolio performance and model health.

Metric	Frequency	Benchmark	Purpose
Net Present Value (NPV) Trend	Quarterly	Must trend toward **$0+**	Ensures long-term investment viability.
Effective Portfolio Yield	Monthly	Must exceed **Default Rate × LGD**	Confirms risk-based pricing adequately absorbs expected losses.
Segment 1 Default Rate	Weekly	Stable around **6.66%**	Tracks highest-risk segment to validate premium pricing.

B. Early Warning Indicators (EWIs)

These indicators reveal drift in assumptions or adverse market shifts.

Indicator	Signal	Action Trigger
Cashflow Volatility Shift	Mean volatility ratio shifts **> 1.5 SD** (30-day window)	**Model Review:** Investigate market drift or behavioral changes.
Avg. Payment Speed Slowdown	Avg payment speed increases **≥ 10%**	**Product Adjustment:** Enhance pre-collections and borrower communication.
Pricing Tier Default Creep	Segment 1 defaults exceed **7.5%** for two months	**Pricing Adjustment:** Immediate **5% premium increase** for Segment 1.

3. Future Model Development Strategy (Phase 2 & 3)

A roadmap to transition from the current model (Logistic Regression, **AUC = 0.5962**) to a more powerful predictive system.

A. Model Upgrade Specification

- **Target Algorithm:** XGBoost or LightGBM
- **Expected Performance:** ROC AUC **> 0.70**
- **Deployment Approach:**
    - Use a **Champion/Challenger framework**.
    - Logistic Regression = *Champion* (current live model)
    - XGBoost = *Challenger* (goes live only after surpassing LR in performance + stability)

B. Strategic Feature Engineering & Data Enrichment

To enhance predictive power and support advanced non-linear models like XGBoost.

Data Source / Focus	**Proposed Features**	**Rationale**
Alternative Data Enrichment	Volatility Quartile (categorical derived from volatility ratio)	Helps XGBoost capture extreme risk bands.
Interaction Terms	Volatility × Partner_Risk_Score	Models compounded risk from high-volatility borrowers tied to risky partners.
Recency & Velocity	Time Since Last Loan, Frequency Trends	Introduces crucial temporal and behavioral signals.
Value Chain Data	Concentration Index (dependence on top 3 partners)	Quantifies concentration risk and exposure to shocks.