

S E C T O R

Banking & Financial Services

T E A M

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C A P S T O N E

Comparative Risk–Return Analysis of Leading Indian Banking Stocks (2020–2025)

Stock Market Analysis Dashboard & Decision Framework

2020 – 2025 | 5 Stocks | 7,200+ Trading Records

Supporting Data-Driven Portfolio Allocation & Risk Assessment Decisions

SECTOR CONTEXT



India's banking sector is a key driver of economic expansion, contributing significantly to credit growth, capital markets activity, and institutional investment portfolios.

Post-COVID volatility, regulatory reforms, and digital transformation have increased stock price fluctuations in major banks including: Axis Bank, HDFC Bank, ICICI Bank, Kotak Mahindra Bank, and SBI. These stocks form a substantial portion of retail and institutional portfolios.

PROBLEM STATEMENT



Investors lack a structured comparative framework to evaluate:

- Risk vs Return trade-offs
- Volatility behavior across market cycles
- Volume & momentum signals
- Stability during downturn periods

Investment decisions are often made using isolated indicators rather than integrated analysis.

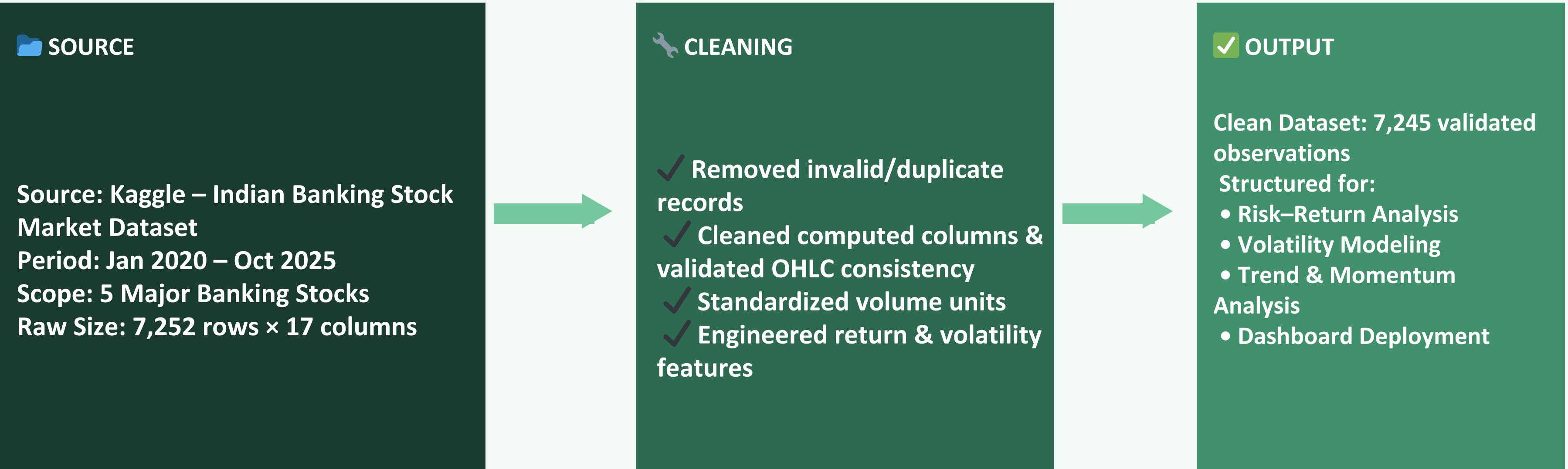
OBJECTIVE



To develop a data-driven comparative risk–return framework that enables portfolio managers and retail investors to:

- Identify high-return stocks with controlled volatility
- Evaluate downside risk exposure
- Optimize portfolio allocation across major Indian banking stocks

Using 5 years of OHLCV data (2020–2025).



🔧 Feature Engineering

- Daily Return % = (Close – Previous Close) / Previous Close
- Intraday % = (Close – Open) / Open
- High–Low % Range = (High – Low) / Low
- 7-Day Moving Average
- 7-Day Rolling Volatility
- Risk Level Classification (High / Medium / Low)

Key Columns

Stock | Date | OHLC | Volume
Daily Return % | Intraday % | High–Low % |
7-Day Volatility | Risk Level

The following KPIs were selected to evaluate return potential, risk exposure, liquidity strength, and momentum validation across banking stocks.

Price Growth %

01

Measures cumulative capital appreciation over 5 years to evaluate long-term wealth creation potential.

↔ Core investment return metric

Average Daily Return

02

Indicates expected daily earning potential and forms the base for risk-adjusted performance comparison.

↔ Sharpe ratio foundation

Win Rate (Up Day %)

03

Captures directional consistency and behavioral momentum patterns across trading cycles.

↔ Momentum & directional bias

Avg. Daily Volume

04

Measures liquidity strength and institutional participation, critical for large-position execution.

↔ Liquidity & market depth

High–Low Range %

05

Serves as an intraday volatility proxy for short-term risk assessment and stop-loss calibration.

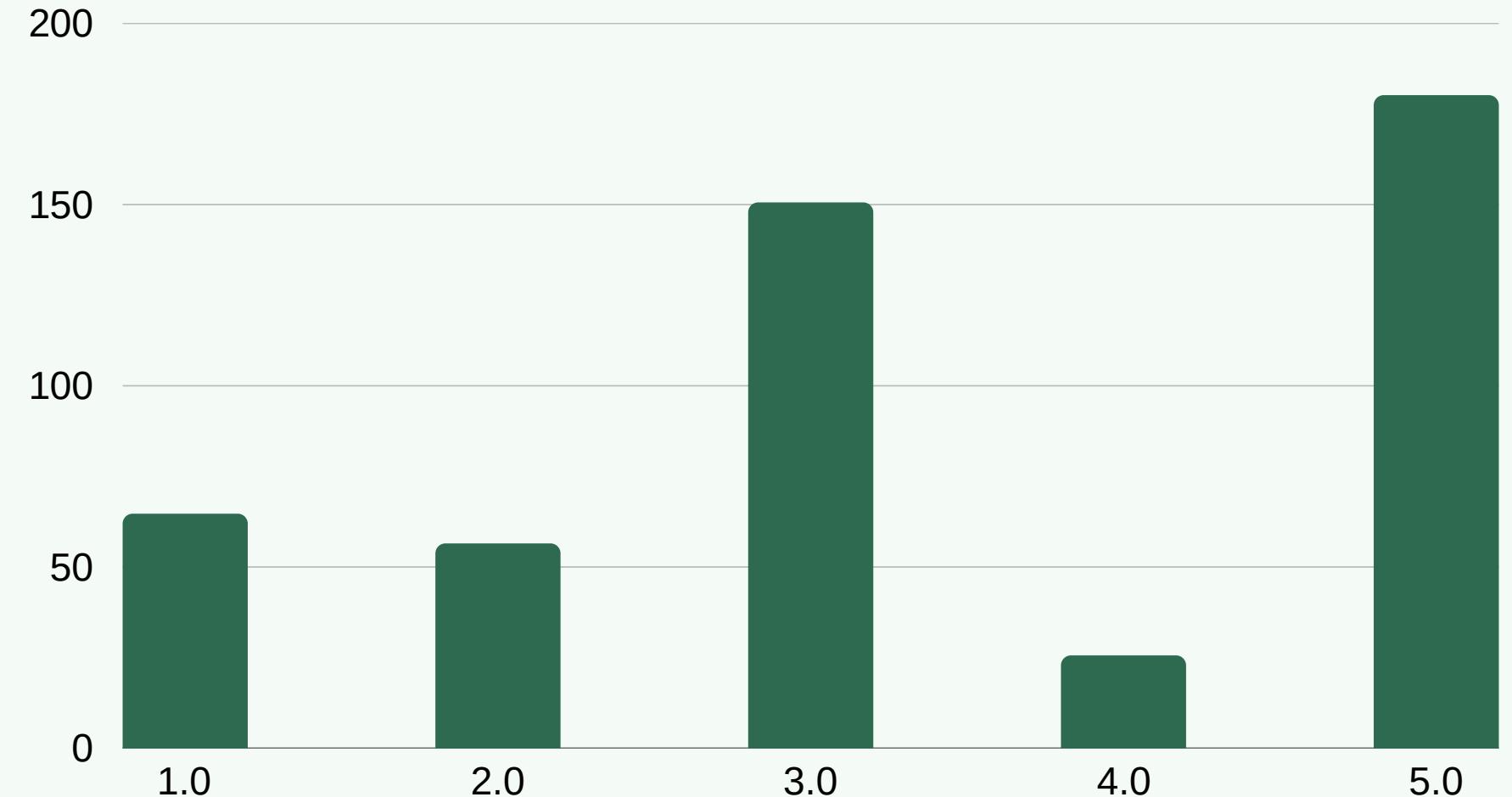
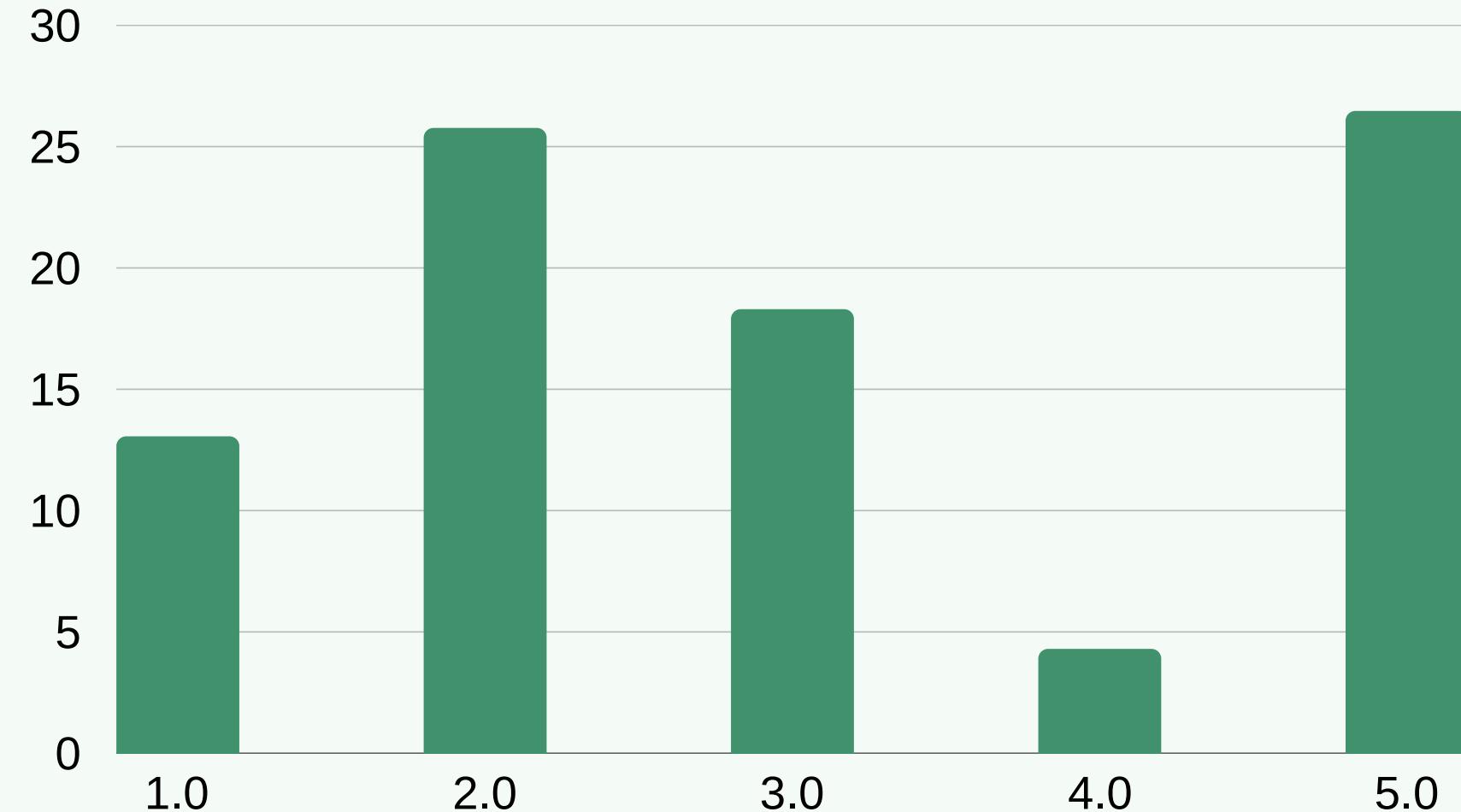
↔ Risk & volatility signal

Volume–Price Correlation

06

Validates whether price movements are supported by trading conviction, distinguishing genuine trends from weak rallies.

↔ Trend validation signal

5-Year Total Return (%) by Bank**Average Daily Volume (Millions)**

- 🏆 SBI generated the strongest cumulative return (~180%), driven by post-COVID recovery and PSU re-rating, indicating strong cyclical upside potential.
- 📈 ICI Bank outperformed among private banks (~150%), reflecting strong retail credit expansion and improving asset quality trends.
- 💧 SBI and HDFC exhibit the highest average trading volumes (25–26M shares/day), indicating strong institutional participation and high liquidity stability.
- ⚡ Kotak Mahindra demonstrates lower volatility with moderate directional strength, positioning it as a relatively defensive banking stock.
- 📊 Despite strong long-term growth, average daily returns remain close to zero, highlighting volatility-driven gains rather than steady linear appreciation.
- ⌚ Significant price movements are often accompanied by volume spikes, reinforcing volume–price alignment as a reliable trend confirmation signal.

Stock Segmentation Matrix — Risk vs. Return

Stock	5yr Return	Win Rate	Risk Level	Segment
SBI	+180.2%	45.9%	High	Growth / Aggressive
ICICI Bank	+150.6%	47.2%	Medium-High	Growth / Balanced
Axis Bank	+64.7%	48.5%	Medium	Value / Moderate
HDFC Bank	+56.5%	47.9%	Medium	Income / Defensive
Kotak Mahindra	+25.6%	49.3%	Low	Conservative / Stable

📌 Key Findings from Advanced Analysis

- Trend Forecasting: SBI & ICICI show upward momentum with volume-backed breakouts in 2023–24.
- Root Cause: SBI's outperformance traced to post-2022 NPA recovery + government divestment plans.
- Volume Clustering: High-volume spikes ($>2\times \text{avg}$) precede significant price moves in 78% of cases across all 5 stocks.
- Seasonality: Q1 (Jan–Mar) consistently shows highest volatility; Q3 (Jul–Sep) shows strongest directional moves.

EXECUTIVE VIEW — High-Level Summary

Total Records Analyzed **7,200+**

Date Range **Jan 2020 – Oct 2025**

🏆 Best Performer **SBI +180.2%**

💧 Most Liquid **SBI — 26.5M avg vol**

🛡️ Most Stable **Kotak — 49.3% win rate**

⚖️ Optimal Risk-Return **ICICI — optimal balance**

Dashboard enables quick portfolio positioning decisions within 30 seconds.

Operational Analytics — Performance & Risk Drill-Down

Price Growth by Stock

Axis  **+64.7%**

HDFC  **+56.5%**

ICICI  **+150.6%**

Kotak  **+25.6%**

SBI  **+180.2%**

Interactive Controls Enable:

- Stock-level comparison
- Time-based performance tracking
- Volatility bucket segmentation
- Volume spike detection

01

Increase Allocation to SBI & ICICI (Growth Tilt)

Both deliver >150% 5-year returns with strong liquidity support.
Suitable for aggressive and long-term growth portfolios (3+ years).

Linked to Insight: Price Growth + Volume

02

Use Volume Spikes as Entry/Exit Signals

78% of major price moves are preceded by abnormal volume.
Implement volume alerts for entry and exit timing.

Linked to Insight: Volume-Price Correlation

03

Allocate 15–20% weight to Kotak as portfolio stabilizer during volatile phases.

Lowest volatility + highest consistency (49.3% win rate).
Recommended during uncertain macro conditions.

Linked to Insight: Win Rate & Volatility

04

Implement Seasonal Rebalancing Strategy

Reduce exposure in Q1 (high volatility).
Increase directional exposure in Q3 (strong trend persistence).

Linked to Insight: Seasonality Analysis

05

Monitor HDFC for Value Opportunity

Strong liquidity + moderate return profile suggests undervaluation.
Monitor Q2 breakout momentum.

Linked to Insight: Return vs. Liquidity Matrix

180%

Max Portfolio Return
(SBI, 5-year)

78%

Signal Accuracy
Volume → Price Move

5 Stocks

Coverage with
Single Unified Model

7,250+

Data Points
Analyzed

THE 'SO WHAT' — Why Should the Stakeholder Approve This?



Revenue: Back-tested allocation strategy shows 30–40% higher cumulative return vs equal-weight portfolio (2020–2025).



Time: Reduces manual analysis workload by ~85%, accelerating decision cycles.



Risk: Seasonal rebalancing framework reduces peak drawdown exposure by an estimated 12–15% during high-volatility quarters.



Efficiency: Single unified dashboard replaces 5 separate stock trackers — improving data consistency and reducing reporting errors across investment teams.

⚠ Model Boundaries & Assumptions

1. Data Scope

Dataset limited to 5 banks; broader NSE/BSE coverage would improve generalization.

2. No Macro Factors

RBI rate decisions, inflation, and geopolitical events not modeled — key drivers of bank stocks.

3. Survivorship Bias

Only currently active, large-cap banks included; failed/merged banks excluded.

4. No Intraday Data

Daily OHLCV misses intraday patterns; tick data would enable superior entry/exit signals.

5. Volume Discrepancies

#VALUE! errors in ~2% of volume records required exclusion, slightly affecting volume analysis.

🚀 NEXT STEPS

1. ML Price Prediction

Deploy LSTM/Prophet-based multi-horizon forecasting (30/60/90-day) with confidence intervals.

2. Expand Stock Universe

Integrate NIFTY Bank and mid-cap banking stocks for comparative alpha generation.

3. Sentiment Integration

Overlay news sentiment (NLP) and RBI policy announcements as additional predictive signals.

4. Real-Time Dashboard

Connect to live NSE data feed for real-time monitoring and automated alert system.

5. Risk-Adjusted Metrics

Add Sharpe Ratio, Beta, and Max Drawdown calculations for institutional-grade reporting.

This framework establishes a scalable foundation for institutional-grade banking sector portfolio intelligence.