Finance Analytics Project Report

Stock Market Analysis using Snowflake, dbt, and Tableau

Objective

The goal of this project was to analyze historical stock data and uncover key market insights by building a robust data pipeline using:

- Snowflake (data warehouse)
- dbt (data modeling)
- Tableau (visual analytics)
- VS Code

Focused on five technology-sector stocks — AAPL, MSFT, AMD, NVDA, and one more and created dashboards to explore volatility, return trends, sector rotations, and stock-level comparisons.

Data Pipeline Overview

1. Data Source: Historical data for 5 selected stocks via Yahoo Finance API, including:

- Daily prices (open, close, adj_close)
- Sector classifications

2. Warehouse: Uploaded raw CSVs into Snowflake (finance_analytics.raw schema)

3. dbt Transformations:

- stock_returns: Daily returns + 30-day rolling return
- stock_volatility: 30-day rolling standard deviation of returns

- market_pulse: Combined model with price, return, volatility, and sector info

4. Data Modeling: Final model market_pulse served as the central fact table in Tableau

Dashboards Created

Dashboard 1: Sector-Wise Market Pulse

Purpose: Snapshot view of return and volatility trends by sector

Visuals:

- Sector filter
- Line chart of 30-day rolling return
- Line chart of 30-day rolling volatility

Insights:

- Tech sector exhibited higher volatility and larger swings in return
- Momentum patterns emerge clearly around earnings season and macro events

Dashboard 2: Volatility vs. Return Scatter Plot

Purpose: Identify risk-adjusted performance

Visuals:

- Scatter plot: x-axis = 30-day rolling volatility, y-axis = 30-day rolling return
- Each dot = ticker on a given day
- Sector color coding

Insights:

- AAPL and MSFT clustered with lower volatility, moderate returns (defensive bets)
- NVDA and AMD occasionally moved into high-risk, high-reward territory

Dashboard 3: Time Series of Return & Volatility by Ticker

Purpose: Explore temporal dynamics of each stock

Visuals:

- Dual-axis line charts:
- One for return
- One for volatility
- Parameter to select ticker

Insights:

- Return spikes often preceded volatility increases
- Rolling return helped isolate medium-term trends from day-to-day noise

Dashboard 4: Sector Rotation Analysis

Purpose: Spot which sectors are gaining or losing momentum

Visuals:

- Time series of average 30-day return by sector
- Smoothing applied for clarity
- Optional bar chart for recent monthly sector ranking

Insights:

- Sector leadership shifted noticeably over time

- Tech outperformed in early months, then saw relative decline

Dashboard 5: Stock Comparison View

Purpose: Side-by-side comparison of selected stocks

Visuals:

- Small multiple layout: each stock in its own chart
- Uniform axis scaling for fair comparison
- Indexed price performance (normalized to 100)

Insights:

- NVDA significantly outperformed after normalization
- MSFT remained the most stable and consistent

Project Highlights

Area Details

Tech Stack —> Snowflake (warehouse), dbt (transforms), Tableau (dashboards)

Data Models —> stock_returns, stock_volatility, market_pulse, relative_perf

KPIs Tracked —> Daily return, 30-day rolling return, 30-day rolling volatility

Skills Demonstrated —> SQL window functions, dbt model ref chaining, Tableau parameter usage

Reusability —> Project supports plug-and-play for any new tickers or sectors

Scalability —> dbt models + Snowflake allow scaling to hundreds of tickers

Conclusion

This project demonstrates a full-stack analytics workflow from data ingestion to dashboarding and tailored for financial market insights. The ability to dissect volatility, track sector leadership, and compare stocks side-by-side makes this toolkit valuable for analysts, PMs, or investors.