AI for the Next Era of Banking

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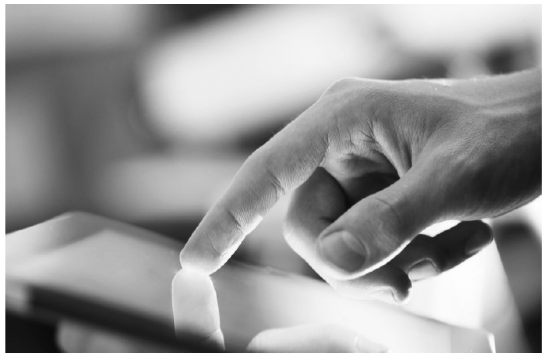
Three Pillars of the Future of Finance

AI & Quantum

- Regulated AI
- Autonomous Agentic Operations
- Foundation & World Models
- Quantum Computing



Digital Trust

- Trust, Ethics & Regs
- Quantum-Safe Cryptography
- Decentralized Identities
- Sovereignty

Digital Assets

- CBDC, Stable Coins, …
- Asset Tokenization
- DeFi is Mainstream
- Unified Ledgers

Agentic AI In Financial Markets

One Financial Markets Trading Example

Agentic AI represents a blend of creativity, memory, reasoning, and task execution. It moves beyond standard chat interfaces into active decision-making.

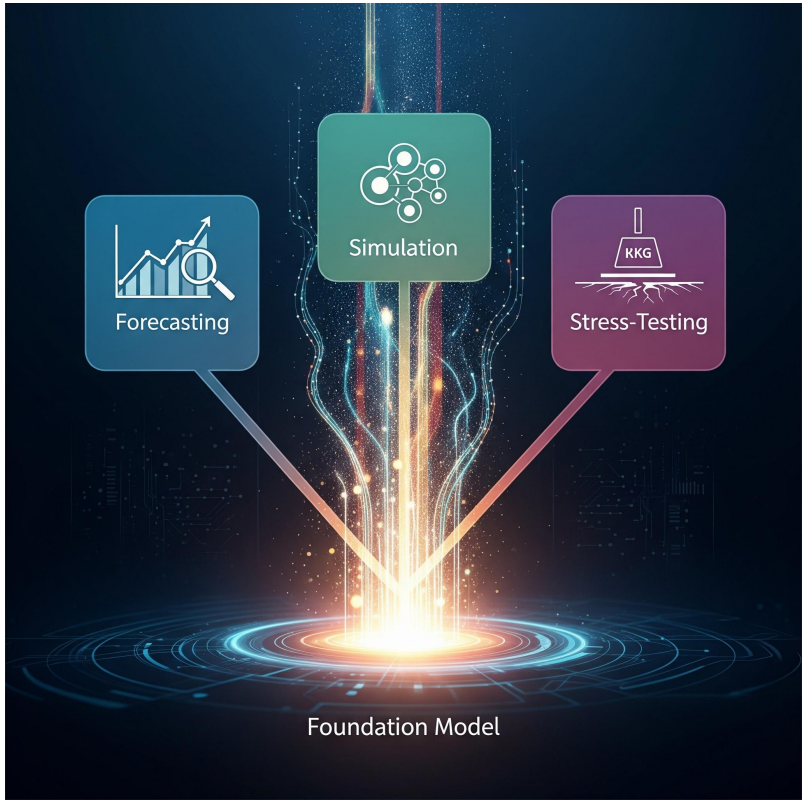
- **Market Simulation:** Generating synthetic, causally plausible price paths.
- **Risk Metric Generation:** Discovering and refining stochastic differential equations (SDEs) for historical pricing.
- **Trader Insights:** Offering deeper, robust quantification of tail risks and potential market shifts.

Source: Barclays & Simudyne Paper (2025) "To Trade or Not to Trade: An Agentic Approach to Estimating Market Risk Improves Trading Decisions" https://arxiv.org/abs/2507.08584

Foundation Models in Financial Services

A foundation model learns the structure of an entire domain, then adapts to many tasks from a single trained system.

Trained At Scale	▸ Built on the same breakthroughs behind today's most advanced AI systems, on enormous volumes of data.
Learns General Patterns	▸ Captures the underlying behaviour of its domain rather than memorising a fixed set of examples.
Adapts To Many Tasks	▸ One trained model becomes a tool for forecasting, simulation and stress-testing alike.



Rethinking Market Prediction: Two Types of Foundation Models

Autoregressive vs. Diffusion

Autoregressive: Financial markets are noisy and unstable. Transformer-based Autoregressive Models build sequentially; an early error compounds until the output fails.

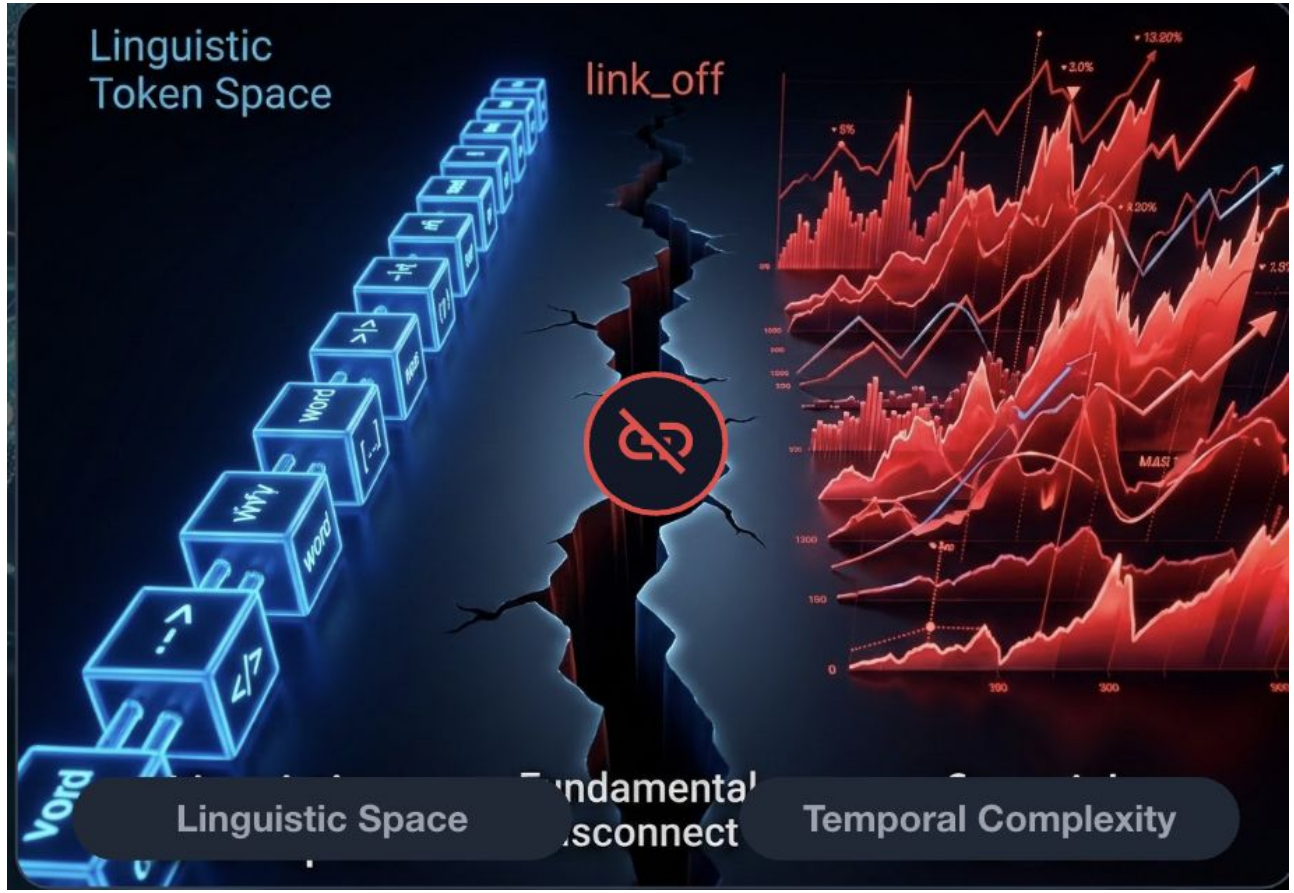
Diffusion: Diffusion Models learn the probability landscape of plausible market states - much like a sculptor molding a statue all at once. This identifies stable market configurations more reliably.

Simudyne

The Limits of Generative Transformers

Critical Constraints

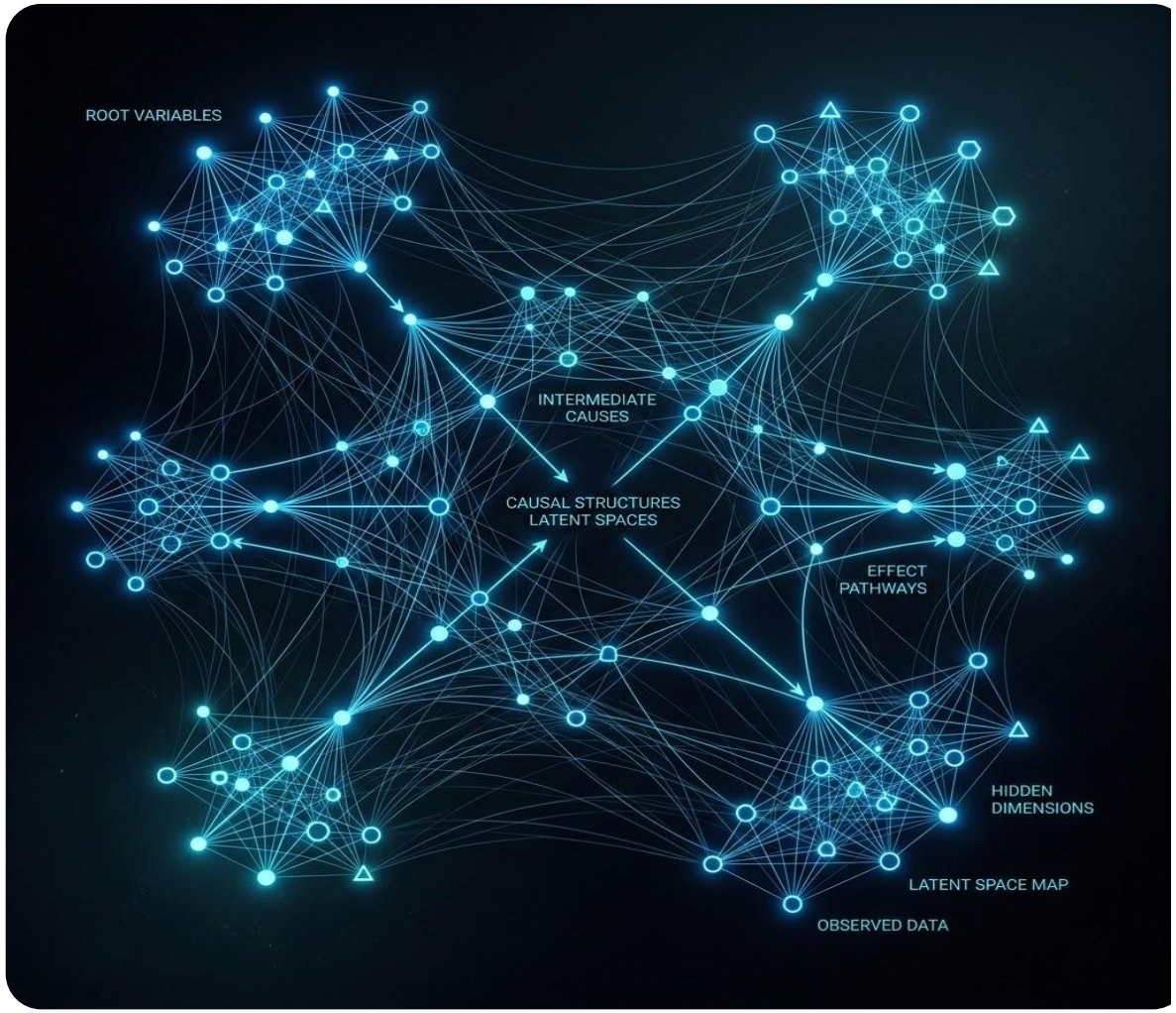
- Operate strictly within a linguistic, tokenized sequence space.
- Rely on statistical correlation rather than causal understanding.
- Struggle with continuous temporal misalignment in financial series.



The Genesis of World Models

The Potential

- **Predictive Causality:** Moves beyond correlation to understand the cause-and-effect relationships driving market behavior.
- **Decoupled Intelligence:** Separates the understanding of how markets work from the specific strategy or policy being tested.
- **Adaptive Simulation:** Processes complex, continuous data streams to model evolving environments in real-time.



Operational resilience is not merely business continuity; it is the ultimate outcome of uncompromising, effective risk management.

THE RED HAT FSI PERSPECTIVE

Operational Resilience – Regulator Definitions

- ✓ **US Federal Reserve** – The **ability to deliver operations**, including critical operations and core business lines, through a disruption from any hazard.
- ✓ **European Central Bank** – The ability to **continue the supply of important business services** to clients and local markets during a disruption.
- ✓ **Bank of England** – The ability of firms and the financial sector as a whole **to prevent, adapt, respond to, and recover from operational disruptions.**

The Resiliency Mandate

Today's Innovation Drivers

- **Generative AI:** Enhancing developer productivity and code management.
- **Agentic AI:** Systems capable of executing complex, multi-step tasks.
- **Machine Learning:** Deepening insights and automating compliance.

These technologies promise higher-value innovation and increased operational velocity.

Operational Challenges

- **Cybersecurity Threats:** Expanding attack surfaces require advanced defenses.
- **Data Privacy:** Strict handling of PII within large language models.
- **Black Swan Events:** Preparing for unpredictable, high-impact market disruptions.

Scaling AI requires an absolute mastery of these foundational risks.

The State of Generative and Agentic AI In Financial Institutions

Financial Services AI is shifting from experimentation toward industrialization to drive revenue & growth.

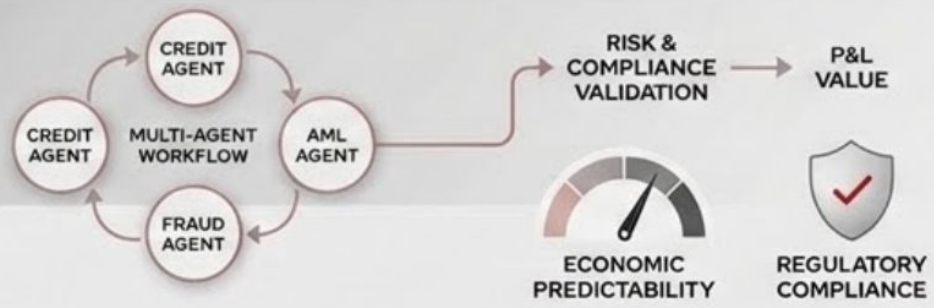
Phase 1-Fast Start: Experimentation Phase

Financial institutions implemented Gen AI for Document Summarization and Code Generation

According to a MIT report 95% of Gen AI failed to deliver positive ROI.

Phase 2 Scale: Industrialization Phase

Transition AI to a systematic, scalable, and regulated core operational function to deliver real P&L value



1. AI in Banking American Banker, Red Hat Sponsored
2. ("Experimentation to Industrialization") Major technology research and strategic consulting firms (such as McKinsey, Gartner, Capgemini, and Accenture) define the current evolution of generative AI as a transition "from phase 1 experimentation to phase 2 industrialization".

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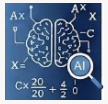
AI: Requires Engineered Trust and Control

Verification As Infrastructure

Platform integrity

- Zero-trust OpenShift foundation (identity, isolation, least privilege)
- Signed containers, signed pipelines, SBOMs for full supply-chain visibility
- Auditability across the entire AI lifecycle

Model integrity



- Transparent, inspectable open models with clear provenance
- Model signing + AI-BOM for verification and traceability
- Explainability and evaluation with TrustyAI

Outcome integrity

- Policy-based output governance (via Guardrails)
- Prevent jailbreaks, misuse, and unsafe model behavior
- Keep responses aligned with your rules, domain, and compliance needs

Thank you

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