Sequoias & Mayflies: Where Risk Really Lives in Transactions

1. Introduction – A Continuum of Transactions

Having worked on a very wide range of transactions and transaction types over the past 45 years, from one-off capital markets trades, to structured programs and funds executing streams of trades, to slow-moving bespoke private market transactions to finance infrastructure projects and assets, I have been looking for a unified typology and approach to place transaction types along this continuum and identify optimum risk treatments for each type.

Risk in financial and operational systems is classically broken down into categories such as market risk, credit risk, operational risk, and so on. These are useful to a point, but they obscure a more fundamental question which should be answered: "how and how often does a transaction system[1] commit capital, and how does front-end design relate to 'run-time' execution?"

A system that commits capital once or twice, in large and largely irreversible steps to large real assets such as the building of a power plant or an office building (for the purposes of this paper, I am going to call these transactions "Sequoias" due to their size and longevity), has different characteristics from systems that commit capital more or less continuously in small increments (let us call these transactions "Mayflies" because of their individually ephemeral nature).

Both Sequoias and Mayflies can be described in terms of how and when design decisions are made, and how and how often the system commits capital through transactions, and how those features mean risk should be assessed, mitigated, and managed.

The difference between them is not scale, but the relationship between design and the frequency of commitment through capital transactions, and where risk must be built in. The conclusion is that the lower the frequency of commitments, the more risk must be mitigated upfront. The higher the frequency, the more risk must be managed in real time.

To explore these ideas, this short paper will compare and contrast transaction types at the two ends of the continuum, but I posit that most transaction types lie on this continuum between these extremes, and I look forward to fleshing out this typology and analysis in future.

[1] By 'system', here I mean a group of participants in one or more transactions, including human decisionmakers, principals, agents and counterparties, as well as systems such as algorithmic trading programs or quant market models.

2. Liquidity and Layered Transaction Systems

The presence of liquidity does not change the underlying nature of a transaction system, but it does introduce an additional layer. For example, a long-duration infrastructure asset financed through a project structure remains a Sequoia in terms of its commitment profile: capital is deployed infrequently and irreversibly, and risk must be mitigated upfront through design and counterparty alignment.

However, once the underlying Sequoia asset is operational and generating returns, Mayfly-type transactions can be created and layered on top of it. A simple case would be a refinancing of construction debt after COD[2] through an issue of a tradable bond, or the securitization of other cashflows generated by the Sequoia asset. In the case of a listed bond based on the Sequoia's cashflows, the investor's position in that vehicle may be traded frequently in liquid markets. At this layer, the investment takes on Mayfly characteristics.

The distinction is therefore not between asset classes, but between **layers of commitment**:

- the **underlying asset layer**, where commitments are infrequent and structural; and
- the **trading layer**, where positions may be adjusted continuously.

Liquidity affects the investor's ability to enter and exit positions, but does not eliminate the need for rigorous initial design-time risk mitigation at the asset level.

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3. Two Phases: Design-Time Decisions and Run-Time Commitments

This analysis defines transactional systems in terms of two phases of decision-making:

Design-time decisions

During the structuring phase, where:

- strategy is defined
- structures are designed and built
- counterparties are selected and contracted with, and
- governance frameworks of rules, constraints, and incentives are established

This is where risk is shaped and allocated,

versus

[2] COD = Commercial Operations Date

Run-time commitments

over the life of a series of transactions, where:

- obligations are created
- transactions are executed
- capital changes hands on terms established in the design-time decisions.

This is where risk is taken.

Using this two-level approach, we can describe the two ends of the spectrum, Sequoias and Mayflies, as follows:

Low-frequency "Sequoias" Have long series of interconnected design-time decisions and, from the transaction point of view, a very short run-time phase with perhaps only one or two transactions (e.g. financial close of a large project financing transaction for capex and construction after FID[3]).

High-frequency "Mayfly" systems, if they are strategy-driven, programmatic or done through a fund-like structure, have design-time decisions comprising portfolio design, investment strategy, packaging, seeking regulatory clearances, and fund marketing, during which risks are identified and mitigated. Their Run-time phases may extend for years, according to the longevity of the vehicle or strategy, but the life of individual Mayfly transactions may be only seconds (for HFT[4] positions) or hours or a few days.

Multi-layered cases also exist where Mayfly type transaction systems are built on top of Sequoia-type systems.

Each point on the spectrum or layer in a structure calls for a different balance and mix of approaches to risk and structuring, but those approaches also all fall on a continuum and draw upon each other.

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4. Sequoias: Low-Frequency Transactions Where Risk Must Be Resolved Before Commitment

In low-frequency systems such as infrastructure projects, project finance, real estate, other major capital transactions involving real assets, run-time commitments are:

- infrequent

[3] FID = Final Investment Decision
[4] HFT = High-Frequency Trading

- large
- effectively irreversible

Examples include:

- early-stage equity injections
- execution of major project contracts
- financial close of project finance structures

In these systems, design-time decisions and run-time commitments are tightly coupled. By the time commitment occurs, the structure is already fixed.

Most risk in Sequoia transactions is therefore determined, allocated, and embedded before the first capital commitment occurs.

Counterparty Risk as Structure

Counterparty risk in Sequoia transactions is central and unavoidable. Investors ultimately underwrite the sponsor, who functions as the apex counterparty. Beneath them sits a network of contractual relationships — EPC, subcontractors, suppliers, technology providers, off-takers, feedstock suppliers, lenders, each introducing performance, delivery, and interface risk.

Because Run-time commitments are few and infrequent, this risk cannot be diversified through repetition or being spread across multiple transactions. It must instead be:

- understood in advance
- structured and allocated through contracts
- aligned through incentives

In this context, for instance, procurement is not a purchasing or contracting function. It is the primary mechanism by which risk is allocated, transferred, and enforced.

Implications

In low-frequency Sequoia systems, risk mitigation must be front-loaded. Design and engineering risk is specifically called “Front-End Loaded” for a reason. Errors in design are rarely correctable at run-time. Once capital is committed or contracts are executed, the system and the assets being created largely run on the structure that has been put in place.

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5. Mayflies: High-Frequency Systems: Risk Must Be Managed in Motion

High-frequency Mayfly transaction systems that autonomously generate high-frequency transactions at run-time such as equity, fixed-income or derivatives trades, have the same elements but in different proportions. For Mayflies, run-time commitments occur continuously:

- trades are executed instantly and
- target exposures are recalibrated by models or algorithms
- positions are adjusted regularly in incremental transactions

Each of these is a capital commitment event, even if no human is making a decision at that moment.

Design Moves Upstream

All meaningful decisions occur at design time:

- strategy logic
- signal construction
- risk limits
- execution rules
- system architecture

These are encoded into the system. At run-time, the system executes them.

Counterparty Risk Is Abstracted

In this environment, traditional counterparty risk is largely removed by infrastructure:

- exchanges
- clearinghouses
- margining systems

Settlement risk is neutralised by the fact that the universal counterparty for all trades is the clearinghouse itself. For every purchase of instrument X at price Y, there may be many underlying sellers and vice-versa, but buyers and sellers are invisible to each other and their identities are irrelevant to each individual Mayfly transaction.

What remains are different risks:

- execution quality (price, timing, slippage)
- system integrity (model error, operational failure)

Implications

In high-frequency systems, risk mitigation cannot be completed in advance. It must be embedded in the system and managed continuously through:

- monitoring
- controls
- feedback loops

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6. The Inversion Principle

The contrast between these systems can be expressed simply:

The lower the frequency of run-time commitments (i.e., the more ‘Sequoia-like”), the more risk must be mitigated upfront through structure and counterparty alignment.

The higher the frequency of run-time commitments (i.e., the more “Mayfly-like”), the more risk must be managed in real time through systems and execution discipline.

This is an inversion:

- Low-frequency systems → design dominates
- High-frequency systems → execution dominates

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7. Risk Is Not Eliminated — It Is Relocated

In both cases, risk is not removed — it is relocated.

- In low-frequency systems, risk resides in:
    - structure
    - counterparties
    - contracts
- In high-frequency systems, risk resides in:
    - algorithms
    - execution logic
    - operational systems
    - market movements beyond model tolerances

Understanding where risk lives is the starting point for managing it.

8. Aligning Control with Commitment

A common failure is the misalignment of risk mitigation in the design-time phase with the structure of run-time commitments.

- Applying real-time controls to low-frequency systems does little to address structural flaws.
- Attempting to resolve all risk upfront in high-frequency systems ignores the reality of continuous execution.

The objective is not to eliminate risk, but to align the control architecture with how the system commits capital and obligations: Systems that achieve this alignment are robust.
Those that do not tend to fail in ways that are predictable in hindsight.

This Working Paper is not meant to be either final or exhaustive, but to raise issues and prompt further discussion and detailed consideration in the preparation of all kinds of transactions, from Sequoias to Mayflies and hybrids.

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