LUNAR PUNK LABS

grounding the cosmos

ECONOMIC ANALYSIS

litepaper

Monad: Project Scope

- Potential: Blue funds | Impact Market for Longtail Environmental Stewardship | Regenerative registries

Dyad: Complimentarity

- Essential: Research | Science | Methodology Development
- Existential: Implementation | Technology | Eco-state protocols

Triad: Domain Dynamics

- Active: People | Stewards
- Passive: Place | Bioregions
- Reconciling: Protocol | Community norms/values

Tetrad: Common Action

- Directive: Community culture (Agents, Languages, Perspectives)
- Instrumental: Data and values (Monitoring, Reporting, Verification)
- Ground: Blockchain accounting (Resource, Event, Agent)
- Ideal: Evaluation (e.g Environmental, Social, Governance)

Pentad: Semantic Significance

- Purpose: Impact markets | Longtail Regen Eco-credits
- Value nature: Impact evaluators | Free energy principal
- Significant: Conversation graphs | Markov blankets
- Factual nature: Impact certificates | Applied Science
- Resource: Sensors / sensing | Environmental Stewardship

Abstract

Markets forces can be thought of as a set of determining conditions within material reality. The aggrigated whole of these macro economic mechanisms incentivise the evolution of science and technology by channeling the pathways of research and implementation. Though biased through such incentives, we might consider markets to be an existential steering wheel of tremendous transformative capacity. The essential question quickly becomes how to work with it rather than against it?

Any answer at this point becomes a values assertion but for the purposes of our inquiry let's articulate an asiprational north star of regeneration and bound it to a domain of processes that harmonise people with place. These processes when turned into protocols might be considered regenerative financial instruments. The question then becomes how to represent and evaluate such protocols in a way that meets the markets demand?

Market Hypothesis

Before innovating on such financial technology, let's articulate some working assumptions about the market in order to progressivly approximate some enabling constraints. Let's start with the major market participants and then examine the forces which move them.

Participants (Who)

> - Alpha investors; risk-on. Seeks return on investment. Quantifiers.
> - Beta investors; risk-off. Seeks wealth preservation. Qualifiers.

Our first assumption is that there are two broad sets of market participants that have different risk appetites. The first set of participants are alpha investors and the second set are beta investors. The former have a high risk appetite and the latter a low risk appetite; one set seeks to beat the market and the other desires to 'be' the market.

Animating these actors, let's characterise our alpha investors as hedge funds and our beta investors as pension funds. Here we notice that the former is incentivised by carrots in the form of returns, while the latter does it's best to avoid the stick of regulation and corporate responsibility. Note that costs / risks / benefits moves both sets of participants at a fundemental level. Blue funds or impact markets mediate this by opening up new markets for both appetites.

Institutional Constraints (Why)

The next assumption about markets is that there are $5T of stranded assets that are traded on Wall St. books. These assets take mutliple forms but generally speaking they are below ground commodities like coal, oil and gas, which can't be extracted due to planetary boundary conditions. As these commodities have no intrinsic value their existance essentially depends on an irrational market; when it sobers up these assets will need to be 'struck from the books'.

Both investor profiles are consequentially searching for new stores of value; a phenomena observable through their embrace of qualitive indicators such as ESGs. As always, there is a deal of controversy about the efficacy of these specific values and though imperfect in themselves ESG's have sufficient traction to suffice as a general set of heuristics that help make intervention points more evidant.

Regardless of the specific values, it's apparent that both of our investor profiles are caught in a dilemmea of reconciling qualitive values with quantitive measures. Market participants have plenty of motivation to divest their capital but they lack profitable investment vehicals that can account for a given set of values in a quantifiable manner.

Economic Pathways (How)

Provisioning divestment options consequentially requires the opening of new markets and a set of market makers that hold a completely different mentality from what we know and have seen before. Instead of externalising costs, as entrapeneurs have done in the past, the demands upon the new breed of market makers will be to supply products that instead internalise and account for values. This is essentially a $5T market opportunity for blue funds / impact capable of facilitating such a transfomation; the question is what kind of products would such a marketplace either need or want?

Examining economics in terms of nouns and verbs helps us to distinguish **capital** from **currencies**. Currencies (current-seas) are measures of value flow across time, whereas capital arises from integrating these flows. In that regard we see two forms of measure; the qualitive and quantitive.

From the quantitive perspective, input measurements with the potential for aggrigation might include GIS data, bio-acoustics, nutritient density or brix values ect. These measures are useful at the data level but aggrigating them becomes difficult due to a lack of standards, which is also an issue for the qualitive accounting of heuristics like ESGs. The representation, organisation and translation of such values is a scientific and technical challenge that is only just becoming solvible.

When it comes to these scientific and technological realms, Markov / Friston blankets help in this matter by providing a means to bound unweildy complexity into something more managable. These serve as a base medium from which higher order systems can be assembled. Essentialy, this means that we can now compose data streams into information classes to further build more structured and systematic relationships.

This works for our alpha investors who are seeking volitility and consequentially look towards more complex speculative instruments in the persuit of their asymetric returns. This is where 'adaptive capital' starts to become an interesting pathway.

Adaptive capital (What)

Paradigms like natural capital accounting and payments for ecosystem services have tended towards controversy because much of lifes value is implicit in it's healthy function. This complex behaviour is extreamly hard to package into a product, so we might more easily bootstrap new markets from legacy paradigms. From carbon, to cobenefits... to living capital.

As far as instrument design goes, the representation of noun like products such as carbon is relativly easy. Moving beyond such basic designs we can augment these classic commodities with co-benefits, and beyond that again towards the real-time representation of ecological state. Such a future requires dynamic schemas.

For example, if the ESG heuristics (or SDGs ect) are considered to be our markets aspirational values, we still need to measure, account for and evaluate progress towards them. Such functionality is a necessary substrate to enable the representation of complex and adaptive capital. For such vehicles to arise woluld require the composability of several interoperating standards:

- Ground: Sensing Data (Monitoring, Reporting, Verification)

- Ideal: Evaluation criterea (e.g Environmental, Social, Governance)
- Instrumental: Blockchain accounting (Resource, Event, Agent)
- Directive: Community culture (Agents, Languages, Perspectives)

To represent these standards in a composible way themselves, we can look back to markov blankets as a form of binding agent that allows for nesting at various levels of scale. The above represents a core feature set. Significantly, these blankets can give rise to a number of conceptual primitives around impact markets; namely conversation graphs that can represent certifications or evaluation criterea, while they are also relevant as an API layer for loading arbitrary input schemas (from sensors or other interfaces).

- Resource: Sensing / sensors
- Facts: Impact certificates
- Significance: Markov blankets
- Values: Impact evaluators
- Purpose: Stewardship impact markets

This kind of archetecture is general enough to be instantiated for any given application; be it simple commodities or a chain of complex systems. In this manner we can consider markov blankets to be a form of interface that enables arbitrary input data to be composed, accounted for, certified and evaluated.

Looking back to our investor needs, we note that such a system can adapt to requirements across scales without disruption; from local monitoring, reporting and verification data to global market values like ESGs. Because there is an aggrigation of live data feeds getting evaluated against an ideal state, there is also an investible delta for market participants to profit from. Accounting for a set of articulated values and then evaluating these against the free energy principal also makes the instrument an unenclosable carrier; that which doesen't tend towards harmony fails as an investment vehicle, while that which does suceeds. Regenerative activity consequentially correlates with financial return, thus funneling capital upstream.