The Architecture of a Labor-Backed Cryptocurrency System, the Largent
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This paper proposes an architecture for a labor-backed currency system, the largent, based on my book, *A Radically Beneficial World*, the flow-money paper "Proof of Labor Improvement Proposal" by Julio Moros and Oscar Olivera, and Rob Hitchens' paper, "Proposal for a Credit-Backed Crypto-Currency."

Design Philosophy

The design philosophy of the largent is:
-- The minimum possible system needed to institutionalize the incentives and basic architecture of transactions within the Community Labor Integrated Money Economy (CLIME).
-- Maximize ease of use, which is defined as: it's easy to understand the system's rules (that instantiate the incentives and disincentives), easy to understand why the rules are what they are (to benefit everyone using the system and to discourage cheating and freeriding that hurt everyone in the system), and easy for beginners to start using.
-- Minimize transaction costs by automating as much of the authentication process as possible without threatening the integrity of the reputation engine that authenticates transactions.
-- Self-fund the necessary human-labor audit of the system's "immune response" protections against fraud and gaming the system.
-- Enable participants (members of authenticated community groups) and groups to purchase goods outside the CLIME system, and outsiders to buy goods and services produced within CLIME.
-- Make the design and functioning the largent/CLIME system transparent to users. There will be a market for the largent and the goods and services produced within the CLIME system, and that marketplace must be transparent to all users globally.
-- Enable nation-states to adopt the largent as a national currency.
-- Conceptualize the inner workings of the largent and CLIME as a self-organizing scalable metabolism that employs very simple, basic, robust metabolic functions.

Incentive Structure of the System

The key to designing a sustainable, robust, scalable labor-backed currency is to design in self-reinforcing incentives to use the system to benefit users and groups and provide disincentives to gaming/defrauding the system. In other words, self-interest dictates using the system as designed rather than trying to cheat it.
The most basic individual incentive is: if you join a CLIME group and perform useful work as defined and verified by the system, you will earn money, the largent.
If the group chooses high-value work projects, every member benefits above and beyond their own wage, as the group can sell its surplus or build capital for the benefit of its members.
Each member (participant/user) has opportunities to use their wages (largents) to buy goods and services within CLIME, and to build capital by purchasing tools from outside CLIME if they are not manufactured within CLIME.
The system must make using largents within the CLIME marketplace the highest-value proposition. In other words, the member with 10 largents in earnings will get the most purchasing-power value for

his earnings within CLIME: everything outside CLIME must cost more hours of labor than it does inside CLIME.

The mechanism for insuring this cost structure is described below in Largent-Prime.

This incentive for spending earnings within CLIME generates two self-reinforcing positive feedbacks: it creates demand for goods and services within CLIME, and it generates very high money velocity within CLIME.

This incentive to spend earnings within CLIME is also reinforced by the flow-money concept of "use it or lose it": largents earned within any trading period (defined here as one calendar month) that are not spent within CLIME are depreciated or lost.

The "immune response" system of the largent is "trust but verify": transactions between groups and members who have established positive reputation ratings are frictionless, but a high rate of random audits of transactions makes it difficult to cheat the system for long.

The cost of cheating/fraud/freeriding is very high: members and groups caught cheating are disqualified and lose all rights and privileges of membership. After a lengthy waiting period of punishment (banishment from CLIME), they are allowed to rejoin with a zero reputation rating and a record of having cheated the system.

The CLIME system's most basic function beyond issuing labor-backed currency is to enable members and groups to accumulate capital that can be used to enhance financial security and wealth. This requires CLIME to integrate seamlessly with the outside world's markets, as not every tool will be manufactured within CLIME: CPUs, solar panels, etc. will likely remain too costly to manufacture within CLIME.

The system must also provide an incentive for vendors outside CLIME to sell goods and services to CLIME groups and members, and to accept largents as payment. This requires an open global currency exchange marketplace for the permanent form of largents, Largent-Prime (also known as Largent2).

Largent and Largent-Prime

The basic largent is a form of credit-money: when labor is performed within CLIME groups, credits and debits are created in the wallets of members who completed authenticated work and in groups whose members generated goods and services.

These credits and debits cancel each other out within each trading period, i.e. each month. The largents emitted/created vanish once a member buys a good or service from a CLIME group.

But there is a critical problem in this basic structure that can only be solved by a permanent bitcoin-like form of the largent, Largent-Prime (Largent2): the only way any outside vendor would ever accept payment in largents is if the currency is permanent and tradable globally.

In other words, the only way a CLIME group or member can buy a mobile phone, 3D fabrication machine, solar panel, small generator, etc. from the outside world is to have a permanent currency to offer in exchange.

The only way that permanent currency will have any tradable value is if it is 1) its issuance is limited in some intuitively understandable fashion, and 2) there is demand for that currency somewhere in the system, for what ultimately creates value in a permanent cryptocurrency is utility in everyday transactions and marketplaces, i.e. demand for the currency from buyers and sellers.

Tradable and Non-Tradable Goods and Services

A key distinction in any labor-backed currency system is between t*radable and non-tradable goods and services*. This is best illustrated by an example.

Let's say two CLIME groups, Group A and Group B, both want to construct durable dwellings for their members. Durable shelter is a form of capital and thus it is encouraged by CLIME: durable shelter for the membership is an enormous benefit if members have been living in shantytowns or makeshift housing.

The problem is durable housing requires cement and corrugated sheet metal roofing, both centrally manufactured goods that are not actually fabricated by any CLIME group. So neither group can buy these materials unless they have Largent2 currency, and they can find suppliers willing to accept Largent2s in trade for cement and metal roofing.

As I explain in my book, there will always be suppliers with surplus goods that are earning nothing and using costly warehouse space, and some of these suppliers will be willing to trade these surplus goods for Largent2s *if there is a marketplace in which they can spend these Largent2s*.

That marketplace is the CLIME system.

But there has to be surplus tradable goods and services produced within CLIME for outside suppliers paid with Largent2s to buy; if there is nothing for outside suppliers holding Largent2s to buy, there is no value to Largent2s and nobody outside CLIME will accept largents as payment for anything.

As a result, the *system must incentivize groups and members to generate some tradable goods and services within CLIME that can be sold in the open market* for whatever price the market will bear.

In our example, let's say Group A chooses non-tradable work to perform in its community: for example, caring for the community's children and the elderly. This labor has value within the community, but it isn't tradable: no one in another CLIME group 50 kilometers away can buy these services, and no outside vendor can buy these services, either.

Group B has chosen to grow soy beans as one work project, and to fabricate simple hand-operated oil presses that can be used to extract oil from dried beans and seeds. Both of these products are tradable, essentially on a global scale.

If an outside vendor considers selling cement to these two groups, he can't use his Largent2s to buy anything from Group A, but he could buy Group B's surplus soy beans and oil presses, and then sell them in the outside marketplace.

In essence, the outside vendor is trading a scarce good for goods produced by labor within CLIME.

The system only works for outside vendors if there are tradable goods produced within CLIME that he can buy with his Largent2 currency.

To insure the system enables the accumulation of capital by members and groups, it must incentivize the production of tradable goods and services within CLIME so outside vendors have an incentive to trade their surplus goods for Largent2s.

To institutionalize these incentives, each CLIME group is mandated to devote 50% of its work projects to producing tradable goods and services. These might be locally tradable (for example, perishable vegetables) or they might be globally tradable (oil presses).

Ideally, groups would choose to produce goods that are scarce somewhere in the CLIME system.

The mechanism that insures this is the open market: whatever a group produces that is tradable can be sold for whatever the market can bear, both within CLIME and in outside markets.

This creates a potential problem: if a group can sell its soy beans for a much higher price outside CLIME, then the system could be starved of products available to members and groups with basic largents.

As a result, every group must offer to sell 50% of its tradable goods within the CLIME system and accept "use it or lose it" largents in payment. This can be seen as the cost of doing business within CLIME and the cost of enjoying the benefits of earning largents to spend.

In other words, CLIME only functions if there is a wealth of tradable goods and services available for members and groups to buy, and it only functions if there is a permanent largent (Largent2) that outside

vendors will accept because there are tradable goods being produced within CLIME that he can buy and trade at a profit in the outside world.

CLIME groups have a tremendous incentive to produce tradable goods, as they can sell 50% of these goods into the open market, at whatever price the market will bear—both the marketplace within CLIME and in the outside world.

The only way they can sell more to outside vendors for a profit is if they also produce more for sale/trade within CLIME.

Largent2 Issuance

The key to maintaining the global value of Largent2 is to limit its issuance so the expansion of the money supply of Largent2 aligns with the expansion of tradable goods within CLIME.

When a CLIME group produces a tradable good, it creates value. That good has two intrinsic values: one within CLIME, where anyone with regular largents can buy it, and one outside CLIME, where the 50% of tradable goods that can be sold outside CLIME can be sold for any currency.

So how and when are Largent2s created/issued?

Let's go back to our two example Groups A and B. Group B can sell 50% of its soy bean crop and its oil presses in the open market, for U.S. dollars, silver, local currency, etc.—whatever currency it chooses to accept. It is in effect an enterprise with two markets: the CLIME marketplace, where it must offer 50% of its tradable goods and services, and the outside world market.

Let's say Group A decides to make dried mud-straw bricks, because that's all it can produce at the moment without having a currency that it can use to buy cement.

Group A finds some demand from nearby CLIME groups for its tradable product, but little demand outside CLIME. At the end of the trading period/month, it has basic largents accumulated from sales within CLIME but no outside currencies earned from outside sales. Since it can't buy cement within CLIME, it is stuck: it has no currency outside vendors will accept, and no supplier of cement within CLIME.

If all its unspent largents vanish at the end of the trading period, it received nothing from its surplus production of mud-straw bricks.

Ideally, every CLIME group could manage to sell some surplus tradable goods for dollars, etc., and accumulate currency that it can use to buy goods and services that are unavailable within CLIME. But there will inevitably be mismatches and asymmetries in what groups can produce and what is scarce (i.e. has value) within the CLIME and outside markets, and what they want to buy but cannot buy with basic largents within CLIME.

The solution is to exchange all surplus largents at the end of the trading period into Largent2s at a rate of 10 to 1: 10 basic largents for one Largent2.

The 10 largents vanish and 1 Largent2 is emitted.

We must pause here and think through the incentives being offered to members, groups and outside vendors.

If the system cannot offer members a way to buy goods from outside CLIME, the system will never enable the accumulation of productive capital (tools, solar panels, etc.), as many goods are only manufactured outside CLIME.

If the system cannot issue a permanent currency with permanent value created by demand in a marketplace of tradable goods, no outside vendor will ever sell any goods to CLIME members or groups.

If groups were able to avoid selling their tradable goods within CLIME because their goods were worth more in the outside marketplace, then CLIME would be starved of tradable goods.

If groups were unable to sell to the outside market, there would be no incentive to boost production of tradable goods, and no way to get a currency that could be used to buy goods manufactured outside CLIME.

If some groups had the resources and skills to produce tradable goods that can be sold for dollars, silver, etc., in the outside market, and other groups are unable to produce tradable goods that are scarce (in demand) in outside markets, but what they produce is valuable within CLIME, then there is a perverse incentive to leave demand within CLIME unmet in favor of selling surplus tradable goods in the outside marketplace.

In effect, groups that met demand in CLIME would be punished for doing so, while groups that left CLIME demand unmet in order to maximize profits in outside markets.

The only way to rebalance the incentives so groups benefit from meeting demand within CLIME is to give those groups a means to exchange their surplus "use it or lose it" largents into permanent Largent2s that are the rough equivalent of currencies earned by groups selling to outside markets in exchange for dollars, euros, etc.

There are two final requirements for the issuance of Largent2.

-- Members' surplus largents are exchanged at the 10-to-1 rate at the end of the trading period.

-- Groups' surplus largents earned from tradable goods are exchanged at the 10-to-1 rate into Largent2s.

To understand the necessity of these requirements, we must first understand the organizational rules of CLIME groups.

CLIME groups cannot get paid largents for doing whatever they choose. The work must qualify according to the basic requirements laid out in my book: that the work chosen must fill the most pressing scarcities, and the group must devote some resources to caring for those who cannot care for themselves in the community.

There is a *Matrix of Value* that I did not describe in the book that I will describe briefly now.

Every CLIME group is in effect an enterprise with a pool of available resources and skills. How it deploys those resources and skills should be guided by the answers to this question*: what are the unexploited leverage points in the local system?* Where can the available resources and skills have the greatest impact on meeting local scarcities and community needs?

The greatest value arises from the leverage of applying the least amount of resources and labor needed to achieve the maximum reduction in scarcity.

The purpose of the Largent2 is to enable groups to maximize their local Matrix of Value even if they cannot produce tradable goods with value to the outside marketplace.

But since CLIME needs a wealth of tradable goods and services to function, each groups must produce tradable goods and services—hence the rule that 50% of all work projects/labor must be devoted to producing tradable goods/services, and that 50% of those tradable goods must be available for sale in exchange for largents within CLIME.

If a group claimed that giving everyone in the group back massages was the highest and best use of their labor, this group's work project would be disqualified for payment, as this is not a tradable good or service.

This is the reason why *only those surplus largents earned from selling tradable goods/services can be exchanged for largent2s*.

If we imagine an extreme example, suppose CLIME groups all chose to perform dances and give back massages as their work projects. There would be no production of tradable goods and thus no foundation of value for the Largent2.

The ultimate value of the Largent2 is that *it is only issued when tradable goods are produced for sale within CLIME and/or the outside marketplace*. In other words, the Largent2 is based on the increase of value created by the production of tradable goods paid for with "use it or lose it" largents.

Largent2s can only be issued when there is an increase in tradable goods. This reduces the possibility of a loss of purchasing power (inflation), as the availability of goods for sale increases along with the money supply of Largent2s.

There is one key difference between individual members and groups in terms of exchanging largents for Largent2s.

Groups select work projects democratically, and assign the work as a group. Thus one member might be assigned to produce non-tradable services (caring for the elderly) while another is paid to produce tradable goods sold at a profit in CLIME or in the outside marketplace.

Both workers must have the same opportunity to buy goods that aren't produced within CLIME, and thus all members have the same opportunity to exchange surplus largents for Largent2s at the end of each trading period.

Groups, however, are only able to exchange largents accumulated from selling tradable goods for Largent2s. This sets a strict limit on the quantity of Largent2s that can be issued.

In effect, if $1 billion in tradable goods are produced within the CLIME system, $500 million are exchanged for largents within CLIME (because 50% of all tradable goods must be offered for sale within CLIME)--largents which are extinguished by the transactions of exchanging labor for these goods.

The remaining $500 million are either sold for other currencies or exchanged for Largent2s.

If 10% of all tradable goods produced in CLIME are exchanged for other currencies (dollars, euros, silver, etc.), then *only 40% of all tradable goods' value produced in CLIME are issued as Largent2s*.

In effect, Largent2s are backed by an increase of new value that exceeds the value of the newly issued Largent2s. For every $1 of value produced within CLIME in tradable goods, no more than 50 cents can become Largent2s—and if we assume some percentage of those tradable goods will be sold outside CLIME, then the percentage of total value created that can become Largent2s is less than 50%.

This means the Largent2 will always be backed by more goods/value than can ever be issued in new Largent2s. This bias will over time increase the value of Largent2s, as long as the tradable goods being produced within CLIME meet scarcities/needs, i.e. they have market value.

The Flexibility of Largent2 Issuance

The flexibility of Largent2 issuance adds resilience and adaptability to the largent/CLIME system.

At one extreme, we can imagine a group whose members spend all their earned largents on CLIME goods and services, and thus they have no surplus largents to exchange into largent2s. Their group might sell its 50% of freely tradable goods entirely in the non-CLIME marketplace, leaving no surplus to turn into Largent2s.

In other words, some very successful groups might not exchange any largents for Largent2s, so no new Largent2s would be issued, since the surplus was sold for other currencies.

On the other end of the spectrum, groups with very poor resources and skills might need tools that can only be purchased outside CLIME, and those members and groups might be highly motivated to save every largent possible to exchange into Largent2s so they can purchase a solar panel, bicycle-powered generator, blight-resistant seeds, etc. A relatively high percentage of this groups' largents might be converted into largent2s, requiring a relatively high issuance of new Largent2s.

This dual system (tradable goods must be produced by every group, and 50% of that production must be offered for sale within CLIME) encourages groups to produce tradable goods that are in demand in both CLIME and outside markets, and to increase production to earn additional purchasing power.

The purchasing power of largents and largent2s are both set by supply and demand in both CLIME and outside marketplaces. This dynamic discovery of price, demand and supply helps every group and

member decide how best to spend their earned largents, and to decide what tradable goods and services maximize the groups' productive capacity.

Largent2 as National/Reserve Currency

For reasons explained in my book, it is important to generate a currency that could be used as a national currency and/or a reserve currency—that is, a currency that is the functional equivalent of the dollar, euro, yen, etc.

Imagine a nation with a functional CLIME economy and a crashing national currency. That nation would be well-served by abandoning the devalued currency and adopting the Largent2 as the national currency.

Since the Largent2 is only issued when new tradable goods are produced, the national government/central bank has no power to issue Largent2s, and as a result the Largent2 offers a very stable currency. Since the supply of Largent2 grows along with production of tradable goods within CLIME, the supply of Largent2s expands organically. Unlike bitcoin, there is no upper limit on total issuance of Largent2, but there is a strict limit on the issuance of Largent2.

A national government could raise a reserve of largent2 with a tax on income or transactions that could only be paid in largent2s. This demand for Largent2 would help maintain or increase its value.

Largent2 as a Store of Value

In effect, the basic largent (largent1) is only a *means of exchange*: as a credit-based currency, largents vanish in exchanges or expire at the end of the trading period.

The *Largent2 is a store of value currency* that increases in purchasing power over time, as it is issued as a fraction of new tradable goods produced within the CLIME system. Once this is widely understood, Largent2s will be in demand as a store of value as well as a means of exchange. This recognition of their store of value potential will generate a self-reinforcing feedback of demand.

Labor Generates Value via Producing Tradable Goods That Back a Permanent Currency

We can now understand how a labor-backed, *means of exchange* credit-money/flow-money currency, the largent1, enables the production of tradable goods and services that serve to support a permanent *store of value and means of exchange* Largent2 currency that can scale globally into a reserve currency.

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