Increase Community Currency Circulation: Back It with Appropriate Core Resources

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ABSTRACT

All currencies are backed by resources, whether currency organizers are aware of it or not. These resources can be anything of value that people trade for and include both physical goods as well as human services. The nature of the core resources backing any currency determines how much currency can be issued as well as its greatest circulation potential. In addition, currency organizers must find a way to utilize these core resources to counter the negative impacts caused by shortages of National Currency. This paper will show how core resources are fundamental to every currency and the important impact the choice of core resources has on the effectiveness of any complementary currency.

KEYWORDS

alternate currency; currency circulation; currency backing; core resource; mutual credit; local exchange trading system; time bank; digital currency

The ideal complementary currency

Complementary currencies today suffer from an identity crisis. First, they go by a variety of names incomprehensible to the average potential user: LETS, Mutual Credit, Stamp Scrip, Time Banks, HOURS, B2B, B2C, C2C, 3C, Commodity/Fiat/Digital currency, or some hybrid that combines them together. (Greco 2001, QOIN 2013, P2P Foundation 2010) In addition, the purposes of these differing currency system types have widely differing goals: reduce unemployment, encourage local production, protect the environment, improve business cash flow, keep cash in the community, free underutilized business capacity, make anonymous transactions, and enhance a sense of community, among others. (BerkShares 2013, Bitcoin 2013, Gray 2003, Greco 2001, P2P Foundation 2012, WIR 2013) New currencies are marketed as the magic cure-all for what ails a community.

Yet at the same time, despite long term study and thousands of experiments, complementary currencies have few break-out successes. The good old days that inspire practitioners today date from the 1930s and the only long-term success appears to be the WIR in Switzerland. Most currency experiments follow the same pattern that starts with inspiration, excitement and growth for a year or two, and ends in stagnation, neglect or collapse.

It is abundantly clear to students of currencies that National Currencies (Dollars, Euro's, etc. created by governments) have significant problems that are wreaking havoc on the world's communities. (Lietaer 2010). A single currency being the sole form of money over a wide geographic area is not flexible enough to adapt to the economic situation in local communities. (Mundell 1961) Policy makers and administrators running the National Currency are only concerned with the aggregate data for the country as a whole. As long as a nation's banks, interest rates, consumer confidence and stock exchanges are moving in a positive direction, the negative impacts on local communities' unemployment rates, business bankruptcies or poverty statistics are just outliers in the data.

But for communities suffering when the overall economy may be statistically improving, this does little to help them preserve the businesses and jobs they value most when National Currency failures strike them. These failures are mostly a hidden problem represented by shortages of National Currency, and these shortages are never reflected in any nation's statistics and for the most part remain an invisible cause observed only through their devastating local effects.

Even with these issues, National Currencies have no problem enduring through time. People around the world in both suffering and affluent communities, accept US Dollars or Euros or Japanese Yen and need no explanation of the technical name for the currency system, no persuading of the goals of these currencies, nor instructions on how these currencies work. For nearly everyone, National Currencies are self-explanatory.

The ideal complementary currency is the one that is not only self-explanatory, but self-evident. While National Currencies are in use, their operation is imperfect at the local level. (Greco 2001, Lietaer 2010, Mundell 1961) Local communities should enjoy the benefits that National Currencies provide such as access to national and international markets for products not made in their community while at the same time protecting themselves from the random negative consequences resulting from inevitable

National Currency shortages. A complementary currency must provide currency in times of shortages so that important high-value goods and services in a community are not lost during these unpredictable times.

The goal of this paper is to understand the basic rules that apply to every currency ever created. To do this, we will be keeping it simple by focusing first on the currency tokens themselves, and then looking at how trust is built through supply and circulation is built through demand of the resources that these tokens are redeemed for. Following that, will be a discussion of how to protect communities from National Currency shortages through the selection of proper resources for use to back the tokens. From this foundation, complementary currencies can be solidly built so that the values they represent for any community can be expressed and harmoniously co-exist alongside National Currencies.

Currency tokens and survival

The key to understanding how to strip away all preconceived notions of a currency is to accept one important fact: All currencies are resource backed. Traditionally, when we think of a "backed" currency, we are thinking of a currency backed by some commodity like gold or silver. We must rid ourselves of this perception as this is a holdover from ancient times and in fact has never really been true. How so?

The major point of creating a currency is to avoid bartering. It is simply much easier to carry some token or paper in our pocket rather than heavy bundles of corn or wood or leading around hundreds of cows hoping someone has what we need and wants what we have at that moment. Using a currency allows us to acquire many different items we need using some number of a standard object that can be easily carried on our person.

Most importantly to note, however, is that for a currency to be useful at all, it must at a minimum allow us to "buy" the things we need for survival. If we cannot buy food, clothes, acquire water or build shelter, that particular currency has a significant deficiency and no survival value. Since currencies cannot be used by dead people, it is a safe assumption that without the ability to purchase survival goods that keeps us alive, a currency has little use and we are better off with barter.

Now in this framework let's look at gold. This commodity, generally considered the most important backing for any currency, is completely useless for survival. You get no nutritional value from eating it, can't drink it, it is not comfortable to wear nor suitable to build with. In fact, anyone stuck alone on a deserted island would prefer nearly any scrap of moldy food or a one liter plastic bottle of water from a garbage bin than 100 bars of pure gold. People depending exclusively on gold alone for survival would die very quickly.

Yet outside of a deserted island setting, gold can be used to buy enormous quantities of survival goods. So how can this metal make the jump from practically useless to a valuable commodity able to support entire civilizations with their survival?

What resource backs gold?

To make the jump, we need to define resources more broadly than is normally done when speaking about currencies:

> Resources are any good or service in the economy.

Anything that people value and are willing to trade for is a resource. It includes the traditional types of raw commodities nature provides such as farm products, water, oil, coal, wood, metals, etc. Resources also include human labor such as medical care, teaching, child care, farming, cooking, software programming, etc. In addition, a resource is also a manufactured good that combines both natural raw materials with human labor. Examples of this being cars, houses, mobile phones, electricity, jeans, water purifiers, bottles of fruit juice, breakfast cereals, etc.

Defined this way, anyone that produces something of value can create a currency to make their life easier. (Greco 2013) The farmer or baker can just invent some token to represent their products. Instead of directly bartering their goods and services, they take their self-created token to the shopkeeper and buy some meat or milk. Since the shopkeeper knows the person issuing the currency and will also need their products in the future, she will accept the tokens. When it comes time to get bread, the shopkeeper takes her baker tokens and trades it back for the bread. This closes the currency circulation loop as the baker has honored his obligation to redeem his token for his product, which encourages others to trust the baker tokens.

At some point, someone chose gold as their token. Gold turns out to be the nearly perfect token material: it is a scarce metal that cannot be created by humans in a workshop; it can be shaped to any size, shape, or thickness; is easily identifiable by color and density; it can be intricately designed to make exact copies difficult; and it doesn't corrode over time. But the gold itself was not what made it valuable; it was the underlying resources people could redeem for the gold that made it valuable.

Hypothetically, the baker might have used his gold as bread tokens and the farmer used gold tokens with his markings to allow people to redeem rice. When marking the tokens, the baker and the farmer could immediately recognize their own tokens and guaranteed it could be exchanged for their products on demand. However, since gold was relatively simple to identify and difficult to copy, it was safe for the baker to accept gold tokens created by others as long as it was of some standard quality and weight and as long as there was a surplus of bread available that did not put at risk his ability to redeem his own gold tokens still out there somewhere. He could use the farmers token and even remake it into one of his own tokens.

We do not know the first resources backed by gold. However, it is possible, that what gave gold its enduring backing and high value may be the same resources that give fiat currencies (government produced paper money) part of their backing today: governance services. (Aristotle 350BCE, Mises 1953) As an institution, governments are responsible for the laws that govern territories, including the creation of standards to use within its borders, and have the ability to determine what it will accept as payment (taxes) for its enforcement and other services. Governance leaders and workers may not

directly produce consumable/durable goods but provide public services (defense, law creation and enforcement, administration, etc.) and cannot rely on their own individual resources to acquire their survival goods. Since government is able to enforce standards on any object used as a currency, they are best situated to create regulations for gold coinage across a large geographic area and accept it as payment for taxes. In this case, the resource that backs gold is the multitude of services provided by government. It is these same services which now back today's National Currencies, so there is no need to back today's paper money by gold or any other traditional commodity.[1]

But the impression that gold is the actual valuable commodity persists. Since gold is one of the most perfect tokens due to its physical properties, it has been used for millennia to buy and sell anything around the world. The source of its original underlying resource has been lost, but its usefulness and force of habit has confused most people into believing that the gold is what has the actual value. The reality is that this has never been the case – gold is only valuable for what you can redeem for it. If all vendors of survival goods suddenly refused to accept gold, it would have little more value than a rock.

All Currencies are Resource Backed

In the same way, all complementary currencies are also resource backed. For example, those that use National Currencies are linked to the same governance services backing those currencies. Mutual Credit and Barter systems use business products as their resource backing. (P2P Foundation 2012) Time Banks and HOURS systems are backed by the value of the human services using the currency. (Gray 2003, Sefang 2004) There is a wide variety of resources that may be used in any community as backing for any of these systems, and those resources being used to specifically back a currency will be referred to as "core resources." The success of any currency system will depend on who is able to create the currency and what core resources are represented by the goods or services the creators possess for redemptions.

Since we know that gold is the best time-tested currency token, the requirement to be a successful token is to first mirror the properties of gold. Any token, whether in paper or digital form can possess these features through protection in law, custom or encryption algorithms. The actual form of the currency token is only one element that determines a currency's overall success, which is generally the only part that people intuitively understand. The point is that given long enough time frames under the right circumstances, any currency could obtain the same mythic currency status as gold where people confuse the token with the value it is designed to represent.

In sum, currencies are simply tokens that represent some underlying resource. This resource can be anything imaginable as long as people feel it has value to them and are willing to trade for it. What is now needed is to understand how this wide flexibility for resource choice to back a currency actually imposes automatic limitations as well.

[1] The question of whether Governments *should* create currency at all (backed by the services it provides) as opposed to relying on contributions from privately created currencies will not be discussed here. Since Government created currencies are today's reality, we must assume this will continue and design appropriate solutions with this fact in mind.

Currencies must maintain trust to succeed.

Since a currency is backed by a set of core resources, we must move beyond looking at the features of the token and move to the most important characteristic: the properties of the core resources themselves. The tokens have no meaning if there are no resources that the tokens can obtain, so let's look at how resources give purpose to currency tokens.

The critical understanding is to recognize that a unit of currency can only be created if there is a resource it can be redeemed for. If someone shows up and offers you a piece of paper for the TV you are selling, would you accept that piece of paper?

It depends. Do you recognize the paper? Have you used it before or know others who have successfully used it? How much of a hassle is it to use? Under what circumstances were you or others able to use the paper to buy other things you will need in the future? Do you personally know the holder of this paper and their reputation? These questions arise before even considering how much of the paper you would accept that properly represents the value of the TV.

All of these questions are asked to yourself in an instant, and the answer that comes just as fast depends on one thing: trust. In evaluating the acceptability of any object being used as currency, trust is the largest factor that determines its primary acceptability. If you have prior experience or knowledge that the object will be reliably redeemed for a resource, you are more inclined to accept it. If you are uncertain you can redeem it for a resource you need, you are less inclined to accept it.

This leads to the first rule for a successful core resource backed currency:

> *Rule #1: Every unit of a currency created must be able to be redeemed by its core resource.*

Creating a currency token results in an implicit promise that something is given in return for the currency. The repeated process of creating a currency and redeeming it for its core resource over time is what builds trust that the token truly has value.

On the flip side, the moment that a currency cannot be redeemed for its core resource means that the currency will instantly lose trust and cease to be used. To prevent this situation, there is a second rule that currencies must abide:

> *Rule #2: The maximum amount of currency circulating cannot exceed the total amount of its core resource available right now.*

When the baker uses his tokens to buy milk with the shopkeeper, the shopkeeper trusts that those tokens will buy bread. As long as it does, then trust is maintained. However, if the baker goes on a spending spree and creates more tokens than he has bread available to redeem, he will not only have a lot of angry bread eaters unable to get their bread, but his tokens will no longer be accepted by anyone in the future.

The same is true for every currency. If you suddenly were not able to pay taxes or rent using your National Currency notes, you would stop accepting them and take whatever currency was acceptable to make those payments.

A fast track to trust for complementary currencies

Many complementary currency practitioners have chosen a particular core resource to back their currency: National Currencies. While not technically a core resource, using a successful currency to back a new currency is very common. Nearly all National Currencies began their existence by backing their values with gold, one of the first and most trusted currency tokens in existence.

It is difficult to establish trust in a newly created currency as it requires time and repeated interactions. Often the core resources that a new currency would prefer to use for backing may be unfamiliar to a population and taking the time to build that trust can lead to fatigue and disappointment if there are not visibly positive increases in a new currency's use. The advantage in using a National Currency as backing is that it can accelerate the process of trust building; it allows the new currency to leverage all the familiar trust earned over time by the National Currency. Complementary currencies (such as the BerkShares - See Appendix 1 for more detail) have had remarkable success at establishing trust for their currencies using a National Currency as a backing.

Core Resource backing not enough

However, using a National Currency as a backing for a complementary currency can only be a temporary step. If a complementary currency's only strength is its National Currency backing, the end result will only be a substitution of their numbers and symbols with those of the National Currency. Not only will people tire of the dual accounting headache and conversion procedures, the currency will do nothing to protect communities from National Currency shortages with their negative business cycle impacts or banking crises. To become a true complementary currency requires further steps that more closely aligns the currency with the local economy.

High-Demand resources increase currency use

Having an abundant supply of some core resource that matches the available currency tokens created only demonstrates that the currency is trustworthy, but it does not guarantee that a currency will be accepted for long or circulate. What determines whether a currency will be used comes from the demand for the core resource.

Let's create a hypothetical currency to explain how this works. We will create a currency based on our gardening service (called G$). Each G$ is equal to one hour of gardening and our one gardener can work 40 hours per week. Therefore, we can safely create and spend G$40 every week as all G$40 can be redeemed and no one will make a demand for a redemption that cannot be met.

So now let's go find some people who will accept our G$. Even though we are well liked and respected, we discover that we can't spend our G$ very easily. People who live in apartments and merchants in malls have no gardening needs, so they have no reason to accept our G$. Other people who have

gardens already have a gardener that they like and can pay for using National Currency. They prefer to have the flexibility of National Currency and use it to either shop around for gardeners or to restock the goods that we buy from them, rather than be restricted to just using our one gardener of unknown quality. We even hesitate to spend our own G$ with our most dedicated complementary currency supporter. He will happily accept our G$ to buy his paintings of flies on fruit and then use our service to take care of his house plants when he goes on vacation, but we really don't want those paintings.

In this case, the problem is neither supply nor trust. It comes down to simply what can be bought by the users of the currency and if those goods or services can meet their needs. It makes no practical sense for people, even the creators of the currency, to go through the hassle of using an alternative currency if they cannot buy what they require, no matter how much they believe in the goals or objectives of the currency.

This leads to the third rule for currencies:

Rule 3: The higher the local demand for the core resource, the greater the currency will be used.

All currencies have a maximum circulation potential which equals the total demand for the core resources backing the currency. In our gardener example, there just isn't enough demand to base a new currency on it.

Now instead of choosing gardening services, what would happen if the local bus service created a currency backed by their local bus tickets? Let's also assume that 50% of the population uses the bus every weekday. As half the population uses the bus, it is not difficult to see how any currency issued by the bus company would be easily accepted since one out of every two people have use for the service backed by the currency. The example in Hong Kong of the Octopus Card (see Appendix 1 for details) demonstrates how successful this can be where a stored value card originally designed for use on the subway is now used by 95% of the population for both subway and non-transportation purchases. (Octopus 2013)

Choosing the best core resource: The Universal Resource.

Now we have the basic features for any successful currency.

For the ideal currency token:

- Token must be easy to carry and transport;
- Token cannot be counterfeited;
- Token and its value must be easily identifiable;
- Token must be divisible;
- Token should not degrade or corrode over time.

Anything less than ideal will need mitigating measures or systems to ensure the currency token is as close to the ideal as possible. (For example: enforceable laws against counterfeiting; old or damaged

paper currency can be replaced with new paper currency upon demand to account for degradation.) Note that even tokens that only exist as ledger entries in a bookkeeping system must still maintain these characteristics.

For the core resource backing the currency:

- Every unit of a currency created must be able to be redeemed by its core resource.
- The maximum amount of currency circulating cannot exceed the total amount of its core resource available right now.
- The higher the local demand for the core resource, the greater the currency will be used.

The strongest and most enduring currencies will have all of these features. These are the minimum requirements that complementary currencies must meet to ensure their continued existence.

But complementary currencies have an additional requirement: they must differentiate themselves from the dominant National Currency. Since currencies are all backed by resources, this means that complementary currencies must be backed with different resources than National Currencies or they will follow their same destructive path. The core resources for complementary currencies must be carefully chosen so that they can also successfully compete against the National Currency and by providing benefits to the producers of these resources that exceed the costs involved in using a second currency.

National Currency domination

Before being able to break away from National Currency domination, it is important to understand what core resources are backing National Currencies. From this it is possible for complementary currencies to select their own core resources as backing where they can utilize any local comparative advantages available in their community. In addition, we must have a basic understanding of the source of National Currency shortages so that we can plan how our complementary currency will counter those causes and protect the community.

As mentioned previously in the gold discussion, governance services are one component of National Currency backing. The provision of defense, law making, national level infrastructure and all the various functions of government are resources used by everyone. These resources are generally exclusive to national government (within their own given historical/cultural/political context), so it is not likely that a complementary currency will be able to use these services as their backing. (However, a local government may have distinct services where they are willing to accept the complementary currency as payment.)

The second resource that backs National Currencies is property. Many national governments essentially contract out the ability to create units of National Currency through their banking systems. The banks need to follow a certain set of standards and rules such as fractional reserve requirements and specific loan criteria procedures subject to monitoring by government authorities. New currency is created through loans that are backed by property which consist of homes, offices, vehicles, and various business commodities being used as collateral for the loans/new currency that are issued. (Greco 2001)

This very broad category of resources is one of the areas where a local complementary currency can potentially find appropriate core resources for itself.

Causes of National Currency Shortages

Before making the choice of core resources to back the complementary currency, a basic understanding of the main problem that complementary currencies aim to solve, National Currency shortages, is in order. (Lietaer 2010)

In general, there are two broad causes of National Currency shortages for a community. The first occurs as a result of a banking crisis. Because of the critical role banks have in the creation and redemption of new currency for property loans (Greco 2001), any credit crisis that reduces loan giving by the banks will also impact the amount of currency banks supply in a locality. Much of the time, these crises are completely out of the control of local communities.

The second cause of National Currency shortages is an increase in the amount of currency that leaves the community. This can be a result of a reduction in export business or increases in the number and quantity of purchases made for items not produced in the community. For example, when a car or computer is bought in a community that does not manufacture those items, the majority of the currency spent goes outside the community to that producer. However, if a community is completely self-sufficient in corn, where all the seeds, labor, transportation and equipment maintenance is done entirely locally, then whenever someone buys local corn, that currency stays in the community to produce more corn and support the local economy.

When looked at in combination, the currency creation role of the banking system has allowed many communities to still thrive while heavily dependent on imported products. As currency leaves the community, banks continuously create new currency for local loans that ensure enough currency is available at all times. Businesses are in the habit of utilizing bank credit lines to meet their cash flow requirements. This has also habituated community residents to being able to buy anything they choose without needing to be concerned with any product's manufacturing origin, as the loss of currency is invisible to them.

However, this has created a precarious situation for communities. When banks do not provide the regular volume of loans, the steady reduction of currency through import purchases ceases to be replaced and creates serious economic problems for a community. Those businesses in the loan process at the time these crises hit are first impacted and their struggle is not necessarily a result of reductions in product quality, business strategy or sales. (Although currency shortages will eventually affect everyone's sales as the lack of currency works its way through the community.)

A complementary currency, then, must have not only the basic features required for every currency, it must be backed by core resources that are not dominated by National Currency AND it must solve the problem of currency shortages that result from banking crises and a community's unsustainable reliance on imported products.

Reaction to National Currency Shortages

The natural reaction to date to solve the National Currency shortage problem has been to create a local currency that makes local community residents aware of how their local businesses are negatively impacted by imported products. There are techniques used to demonstrate this that range from making people take specific steps to convert the complementary currency to National Currency or by completely isolating the complementary currency and either limiting or making it impossible to exchange the complementary currency to obtain a National Currency.(See BerkShares in Appendix 1 as an example.)

While creating awareness of the impact of imported goods is a necessary first step, it is not complete. An important thing to note about every community is that there will always be imported products that people want to purchase. It is not in any way desirable that every community produces every possible product that people want. Every community does not need to produce smartphones, automobiles and solar cells as they may not have the materials, machinery, market or skills locally available. Trying to be self-sufficient in everything, apart from being impractical, is also wasteful of resources.

While it may be possible to create an entirely local currency separate from a National Currency, at some point there must be the capability to purchase imported products, even in times of National Currency shortages. However, a local currency, by definition and conscious design, is meant only for local purchases and cannot be used on its own to purchase imported products. National Currencies are already broadly accepted and easy to use for imported products purchases, so it would be a significant loss to a community to lose this benefit. There needs to be a middle ground where the loss of currency due to the purchase of imported products does not negatively impact the community either through inability to supply what is demanded or through National Currency shortages.

Enter the Universal Resource

To accommodate the principles of a currency, solve the problem of National Currency shortages and allow acquisition of imported products requires the selection of a specific type of core resource for backing a local complementary currency. This resource we are calling a Universal Resource:

> A Universal Resource is a community based resource that is entirely available locally, is in near universal use within the community, and is demanded outside of the community.

In addition, there is one absolutely critical task that must be part of the complementary currency's primary objective:

> A complementary currency must invest in the productivity growth of its Universal Resource(s).

Investment in Universal Resources is an absolute necessity. Failure to take this in account or to make it a priority will make it impossible for a community to achieve any sort of self-reliance that protects it from the negative effects of the National Currency.

Let's look at each point in more detail:

1. A Universal Resource is a community based resource that is entirely available locally.

   In times of economic crises, access to imported materials cannot be relied upon. A local currency that is using a core resource based outside the community means that the currency is dependent on availability and access to a resource in a location where users might not be able to travel to in order to redeem their currency. If at any point the currency cannot be redeemed, it will lose trust and cease to be used.

2. A Universal Resource is in near universal use within the community.

   The core resource should be a resource in high-demand and in regular use by the community itself. If local residents do not regularly use the resource backing the currency, few people will be aware of the currency's existence, they will not have practice using it nor will it circulate widely enough to protect the community during National Currency shortages.

3. A Universal Resource is demanded outside of the community.

   In order to afford imported products, a community must be able to produce something that earns income from sources outside the community and sold for National Currency. Without any National Currency, or the ability to sell community products demanded by people outside the community for non-local currency, it will not be possible for the community to purchase imported products when National Currency is unavailable.

So in looking at the candidates for a Universal Resource, communities need to look for those resources where it has a unique competitive advantage in producing. This could be anything from raw natural resources, high quality human resources (medical care, education, specific software development, etc.) or unique manufactured products (packaged food and drink, clothing, toys, etc.)

Because of the import dependence of most communities, it is unlikely that they will be able to fully meet the criteria of having a Universal Resource in the early stages of starting a local currency. Some aspect of the criteria will be missing such as only a percentage of the product is produced locally; the supply for the high-demand good or service is met by an external supplier or; outsiders have not yet discovered the value of the goods and services on offer in the community.

As a result, investment in the Universal Resource becomes an absolute necessity to bring these community resources to the point of being true Universal Resources. In addition, whatever Universal Resource is chosen, must compete with other communities who have selected similar resources, and therefore each community must continually invest in the quality of their resource to ensure it can successfully be sold in the broader market.

By linking a complementary currency to a local Universal Resource and committing to its growth and development, the local currency aligns itself with the local economy. Since every unit of the local currency must be redeemable for its Universal Resource, the only way to expand the use of the currency is for the productivity of the Universal Resource to grow as well. The natural limit to any local currency will be the maximum demand for the Universal Resources backing it.

Without investment in Universal Resource productivity, the currency will remain static. This is the situation with many of the complementary currencies that have stagnated: they have expanded to the limits of supply and demand in their core resources. Once that point is reached, no matter what the core resource, the local currency will not be able to grow beyond that point.

Results of using a Universal Resource

Now let's picture a full complementary currency system in operation using a Universal Resource.

Our hypothetical community is family oriented and uses both a community currency (CC$) and National Currency interchangeably. Backing the CC$ are several high-demand locally produced resources: rice, vegetables from community gardens, childcare workers and software programmers who are recognized as the top developers making artist applications. Each of these four groups is organized with membership criteria and members abide by a set of minimum standards set for their products and services. Any recognized member of these organizations is able to create CC$ for their purchases based on a formula that combines the supply they can produce over a period of one month and anticipated sales over the same period.

While National Currency is in regular supply, it dominates the local economy. CC$ organizers begin the process of acquiring National Currency for investment by making it easy to convert National Currency for CC$, providing merchandise discounts, but keeping the cost of converting back to National Currency high through auctions and fees to encourage local circulation. With some percentage of the National Currency in the bank, CC$ organizers give out no-interest loans to their core resource providers to increase the productivity and sales of their core resources in exchange for a small percentage of income sharing for all CC$ sales. In this way, CC$ regularly circulate since it is easy to buy local food, childcare and software without needing National Currency and the CC$ organizers can earn income to support their operations. It is especially useful for the gardeners and childcare services as they regularly use each other's goods and services which significantly reduce their National Currency requirements.

In times of National Currency shortages, the CC$ dominates. The increased food production from the investments provides quality exports to neighboring communities that can acquire more National Currency and the software developers are still able to continue their work locally and export their products for additional National Currency. It does not matter if local banks cannot support them with National Currency as the normal local trade of CC$ can increase since the local products have a demonstrated value to both internal and external markets.

CC$ organizers are collecting their income through the revenue sharing arrangements with core resource producers they invest in, so the status of the National Currency is not relevant to their operation costs. Since the core resources backing the CC$ are of high quality and exportable, when the CC$ organization sees a demand for higher redemptions into National Currency, it can convert its CC$ holdings into the core resource and sell it on the open market for National Currency. Managed properly, the CC$ organizer can develop systems to gather and store resources when National Currency prices are low and sell them when prices are high to maintain appropriate levels of National Currency for

the community at all times. This provides core resource investment when National Currency is plentiful or conversions for purchasing imported products when there is a shortage.

Conclusion

Universal Resources form the core demand for all other resources in a community. Historically, communities are created around a particular resource. This could be a mine, fertile farmland, natural beauty, a great harbor, etc. Around this critical resource grows a set of support services (such as food, housing, education, transportation, etc.) that allow people to work on the quality and quantity of the Universal Resource production. Over time, and with the depletion of a local area's finite natural resources, other Universal Resources can emerge such as a respected hospital, educational institution, tourist attraction, religious practice, or software production center that can form the new core of a community's unique contribution to a region, country or to the world.

A community must take ownership over what it does best and not leave this to chance. Creating a complementary currency is the first step toward self-reliance and since every community has something special to offer, there is plenty of space for many communities to create their own currencies backed by their unique contribution. It is only the residents there who can determine what is most valuable and how to build it into a set of Universal Resources that will bring the community to a state of self-reliance through the use of a complementary currency aligned with their own core values.

APPENDIX 1: Complementary Currency examples

In this part, five currency systems (Bitcoin, BerkShares, WIR, Fureai Kippu and Octopus Card) representing a cross section of solutions will be briefly looked at to show how to identify the strengths and weaknesses of different systems in operation. Specifically, we will look at the token used, the core resources backing it, and the business value added that makes it competitive.

This is not an exhaustive look at each of the currencies. It is only a surface glance that helps to give ideas on how to use the core resource type of analysis to improve the circulation of each currency.

Bitcoin

Digital Currency
http://bitcoin.org/en/

Background: Bitcoins are known as a decentralized, peer-to-peer digital crypto-currency. Bitcoins are created through special software which produces ("mines") Bitcoins at a predetermined rate to maintain scarcity of supply. Anyone possessing a Bitcoin can transfer it to anyone else and a series of Internet servers around the world regularly authenticates Bitcoin transactions so that there is no need for involvement of any central authority. Therefore, like cash, the transfer of Bitcoins can remain completely anonymous.

Token: Electronic only units secured by a 256 bit number (private key) connected mathematically to a specific Bitcoin electronic public address.

Like gold, Bitcoins are tokens themselves. In principle, they have the same features in the digital world that gold has in the physical world: they cannot be counterfeited due to cryptography, they cannot be easily created, but they are easily recognized, are easy to carry, are divisible to eight decimal places and being digital, can exist forever while there are computer networks available to certify the tokens validity.

However, it is the digital nature of Bitcoin that adds a risk in its use as a currency token. First, the electronic internet infrastructure must always be on and available for transactions to occur, so use can be limited geographically, depending on the electronic infrastructure available. In addition, while in digital form it can hypothetically never degrade or corrode, it has a unique feature that physical tokens do not have: the ability to instantly disappear. Whether a problem of trust in the token or through digital attack, it is possible for nearly every unit of the token to be erased, inaccessible or disappear without warning. For physical tokens, this situation is not possible, so it will take time for digital currencies to build trust in the infrastructure, storage and use of these types of currency tokens.

Core Resources: None.

Bitcoins are created through a software "mining" process, so they are not created based on their ability to redeem any particular resource. They are essentially digital objects anyone can find if they know where and how to look. Currently, there is no guaranteed resource that any Bitcoin unit can be redeemed for.

As a result, Bitcoins are not currency in themselves but simply digital tokens waiting to represent something of value that is determined by each user. For Bitcoins to become more widely accepted there must be some high-demand resource producers in a recognized community of users that will accept and trade in Bitcoins in exchange for that resource.

Business Value: Similar to paper currency used in the physical world, Bitcoins are essentially untraceable and can be passed anonymously from one party to another without any central authority monitoring or interference. Currently, there is no consistency as to what Bitcoins can buy, but generally, since they possess these non-centralized and anonymous value features, users seeking to make financial transactions to any geographic space without observers being able to identify them are those that find value and use for Bitcoins.

Since what Bitcoins can buy is variable, the value of Bitcoins will fluctuate widely. The only way to avoid losses in Bitcoin transactions is for two parties in a transaction to instantly exchange their Bitcoins to/from their preferred currencies at the same moment of the transaction or to agree on their value at the time of transfer. If the transaction fees for this exchange are less than the costs of transferring cash through banks or in person, the exchanges themselves were seen as reliable and trustworthy, or there is some core resource that will always redeem Bitcoins for a set value, then more users will be encouraged to try Bitcoins.

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BerkShares

Berkshire Region, Massachusetts, USA
http://www.berkshares.org/

Background: BerkShares were launched in the fall of 2006 as a tool for community empowerment. BerkShares are purchased at exchange banks in the region where US$95 will get 100 BerkShares. All merchants who accept BerkShares agree to take them at a 1 to 1 value equivalent to the US Dollar and can convert Berkshares back into US Dollars.

Token: Paper bills.

Core Resources: US Dollar

This limits the BerkShares to supply only enough BerkShares that can cover the US Dollars on deposit and subjecting the community to the same economic shocks as those impacting the US Dollar circulation in the region.

With a history of operation since 2006, businesses and individuals with a long track record of using BerkShares should have a sense of what local products the currency can best be used for and are in high-demand. These can be the targets for the region's potential Universal Resources for investment.

Any investments that can be obtained from banks or from various government and other community development grants should be used specifically to purchase productive capital equipment. The money should be structured as no-interest loans to producers that are then repaid in BerkShares.

Also, a look at the regional supply chain could provide possibilities for using BerkShares as the units for mutual credit transactions. Local businesses could create their own electronic-only BerkShares backed by their stock of locally produced goods. The electronic BerkShares are not exchangeable into US Dollars and are regularly created and destroyed by businesses conducting these transactions, allowing them to reduce their cash flow requirements when using local suppliers.

Business Value: There is a 5% consumer discount for customers using BerkShares with local merchants. However, without a high-demand core resource to spend the BerkShares with for restocking merchandise or other items not purchasable with BerkShares, businesses must absorb this cost when exchanging to US Dollars.

For added benefits to business, BerkShare, Inc or their exchange banks could offer 0% interest loans to be repaid in BerkShares as an incentive to continue use of BerkShares. Also, a business mutual credit system denominated in BerkShares could help reduce business cash flow needs.

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WIR

Basel, Switzerland
http://www.wir.ch/

Background: One of the longest running complementary currencies, the WIR Bank was created as a credit cooperative in 1934 where each person deposited capital in Swiss Francs to back the WIR. While the initial capital ensured a pool of credit, trust between the participants in their ability to repay their debts ensured circulation of WIR trade credits. The WIR is not directly exchanged for National Currency (Swiss Francs). Businesses are able to join the WIR upon confirmation of their credit history and available collateral and only committing to accepting WIR for a percentage of all sales without needing to deposit any Swiss Francs into an account.

Token: Accounting units; Uses checks or credit cards for transactions.

All tokens are cleared through the WIR Bank as the WIR Bank charges a 1% transaction fee to pay for their operations. However, the use of checks allows WIR to be exchanged by those without WIR Bank accounts by passing around unsigned checks to avoid the transaction fee. This opens a risk for potential counterfeiting.

Core Resources: Business products.

WIR are backed by verified collateral such as property, insurance, and Swiss Franc deposits. Businesses can create WIR based on the collateral accepted by the WIR Bank and issued as a credit line to member

businesses. Redemption of the WIR occurs during the repayment of the credit line from the WIR received through the business' sales.

Focusing on the reputation and value of the businesses in their network ensures that the core resources backing the WIR are of high quality. This allows the WIR to be supplied only in amounts supported by its core resources and ensures that trust is maintained.

The WIR is an alternative national currency so is not concerned with local community economies. Their value proposition is sufficient to attract businesses on a national scale and their fee model allows them to continually operate in a profitable way. While the WIR does offer a way to shift from reliance on Swiss Francs in the event of currency shortages, the WIR is dependent on the production of its core resources to expand and take the place of Swiss Francs. Should any economic crisis occur that restricts its members from continuing production, the WIR will also contract and be unable to provide relief.

To build the WIR into a complementary currency more able to weather longer periods of economic stress, the WIR should look toward investing in high-demand resources that are 100% produced within Switzerland. This will allow the WIR to continue the issuing and redeeming cycle independent of global finance or Swiss Franc crises.

While this may provide some protection on a national level, the WIR cannot provide protection to individual communities. National-level currencies cannot meet the supply and demands for currency of every local community at the same time. This can be seen by the difficulty different people have in spending the WIR in specific localities. For example, in some communities, food may be difficult to purchase using WIR but a hotel room can be fully paid for in WIR. The businesses accepting the WIR are not strategically selected to support a local community's high-demand locally produced resources, so the effectiveness of the WIR in times of crisis will be random. Unless the WIR begins to focus on whole communities, each community is still on its own during Swiss Franc currency shortages.

Business Value: WIR is very successful in the value it adds to customers. The WIR Bank is a source of cheaper loans for mortgages and credit lines than traditional banks. The WIR can use the collateral provided by each business to offset the Swiss Franc cost of loans, providing a more affordable credit. In addition, as loans are denominated in both WIR and Swiss Francs, depositors can also earn a higher interest rate on their Swiss Francs deposited at the bank. The ability to reduce costs directly enhances cash flow and profit for businesses, and this leads to their support of the WIR model.

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Fureai Kippu

Japan

Source: http://ijccr.files.wordpress.com/2012/08/ijccr-2012-hayashi.pdf

Background: A time bank type system where people earn credits based on the time they provide physical care, emotional support and home help to elderly, care-dependent people. The credits can be withdrawn for their own care or for the care of others with some programs allowing purchases of other

goods within a network of specified shops. Those without enough credits to receive care can pay user fees in cash for services. The user fee cash can be distributed to the "volunteers" (in combination with the time credits) or kept for organizational expenses. There are hundreds of organizations that utilize the Fureai Kippu model to provide elder care service in various configurations throughout Japan.

Token: Accounting units.

Core Resources: Human services: dependent care; Japanese Yen.

Everywhere, care for the elderly is a high-demand resource, but is often in short supply. This supply is also under resourced with National Currency which gives rise to the need for a complementary currency to fill in the gaps.

The currencies in the Fureai Kippu system do not circulate very widely as their core resource is extremely specialized and needed only by one segment of the population. Those that earn the credits are not the ones redeeming them at the present, since they or their family members do not need assistance. By issuing credits, each Fureai Kippu is creating an obligation to redeem those credits at some point in the far future, which is very risky for those earning credits now. The supply pool of volunteers when it is time to redeem the credits is unknown and there may not be the ability to fully supply the volunteers on demand that match the credits issued.

Care must be taken by these organizations to determine how much of the Japanese Yen they receive now to pay for their expenses. In the future there may not be any Yen being paid as the use of credits increases.

To mitigate the potential reduction in Yen, there also needs to be backing of the credits by other high-demand resources so that professional staff salaries and rents for the organization can be paid using credits. Alternately, the Fureai Kippu should seek to be the most reputable, high quality service provider of care services, beyond just the elderly. This would require that the various credits be transferable from one system to another and prove that more people prefer the credits over Japanese Yen for these services.

Fureai Kippu are also not well suited as protection for communities from Yen shortages. Specific individuals will have some protection for the care services, but larger economic impacts of unemployment, business credit freezes and reduced access to imported products will not be improved with Fureai Kippu alone. There needs to be other core resources that are more broadly used by all segments of the population to improve circulation of the currency.

Business Value: Guaranteed future care when one is elderly, disabled and with low income is of enormous value to people, especially as families are often living in different urbanized areas and unable to directly care for their older family members. However, there is no business value yet attached to spending and receiving Fureai Kippu currencies outside of the realm of care services. Wider circulation cannot occur unless some benefit is associated with spending these currencies on other goods or services.

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Octopus Card

Hong Kong, China
http://www.octopus.com.hk/home/en/index.html

Background: The Octopus Card is a contactless payment system for public transportation that began in 1997. Value is equivalent to Hong Kong Dollars and is added to the card by waving a card close to a kiosk located in transportation stations and retail stores and then using cash or credit cards or automatic deposits from bank accounts to load value. Payments are made by waving the card next to a card reader which will withdraw the value. There is no ability for individuals to convert Octopus Card credits into cash, but merchants accepting the card are charged transaction fees from Octopus Card transactions. The Octopus Credits are cleared on weekdays and automatically deposited in Hong Kong Dollars into the merchant's bank account.

Token: Electronic stored value smartcard embedded with near field communication chip for exchanges.

Accepting currency from the cards requires the use of special hardware. Person to person transactions without the hardware are not possible.

Core Resources: Hong Kong Dollars, transportation services and company owned property at train stations.

The Octopus Card is not designed to be an alternative currency, so it has primarily relied upon cash deposits to fully back the credits on the card. At the same time, with over 4 million trips per day, the Octopus Card is in a position to create its own currency without the need for Hong Kong Dollar deposits. As the organization owns property in which it leases to retail and other merchants, it can also accept rent payments in Octopus Card credits.

The missing element for creating a sustainable currency is for backing by a local exportable resource. In the event of a financial crisis impacting the Hong Kong Dollar, until the Octopus Card has backing from local resources, there will still be vulnerability to external shocks.

Business Value: Very quick and convenient payment system for customers. The technology for card reading can be placed in vending machines, parking meters, car parks and works with a variety of point of sales machines. In addition, the card can also be used for access control into residential buildings, businesses and schools. As a result, it is estimated that 95% of the Hong Kong population uses an Octopus Card.

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