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TAKING MONEYLESS EXCHANGE TO SCALE: MEASURING AND MAINTAINING THE HEALTH OF A CREDIT CLEARING SYSTEM

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ABSTRACT

Every day brings reports of new financial crises and financial malfeasance within the banking and financial establishment. In an effort to keep the banking system functioning, the largest banks and financial institutions have been relieved by national governments of tremendous amounts of their bad debts, shifting that burden onto the shoulders of the citizenry. At the same time, governments are imposing austerity upon their citizens in order to reduce the extremity of their budget shortfalls. Clearly, the global system of money and finance contains structural flaws that must be recognized and transcended. Reform is very unlikely to come in time to avert widespread social, political, economic, and environmental disasters. That leaves it to citizens, businesses, and communities to take action on their own behalf to ameliorate the negative effects of the failing system. Parallel systems of exchange and finance are both necessary, and easily implemented at the local and regional level. The most effective approach is the process of direct clearing of credits amongst buyers and sellers. This credit clearing process, which is being used in such systems as LETS and commercial trade exchanges, enables the creation of local liquidity based on local production, avoiding the use of conventional money and bank borrowing and moving local economies toward resilience, independence, and sustainability. The focus of this article is on credit clearing as a local exchange option, and deals specifically with the proper allocation of credit within credit clearing exchanges. It explains the causes of (1) the "pooling" of credits, (2) stagnation of circulation, and (3) failure to thrive, it prescribes policies to be applied in credit allocation, and it describes metrics that are important in assessing the performance of individual member accounts and in monitoring the overall health of a credit clearing system. Further, it explains the distinction between private credit and collective credit and the role of each in facilitating moneyless exchange, and recommends procedures for preventing excessive negative and positive balances while enabling both saving and investment within the system.

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1. INTRODUCTION

The primary purpose of a credit clearing system is to facilitate the exchange of goods and services among its users without the use of political money or the need to borrow money from a bank. It is an arrangement that enables "reciprocal exchange," i.e., in which each participant gives as much value as s/he gets, and gets as much value as s/he gives (in real goods and services). Commercial trade exchanges (sometimes called "barter" exchanges) and grassroots community exchange systems, like LETS, are examples of entities that utilize this credit clearing process.

In order to determine the health and effectiveness of such a system, it is necessary to have some indicator(s) that tells how well it is achieving that objective and how likely it is that the system will be sustainable, as well as scalable. Control mechanisms must also be in place to assure that administrative policies established by the membership are being carried out and the principle of reciprocity is being upheld.

By utilizing their own collective credit, participants provide each other with a reasonable span of time within which to reciprocate. It is when the time span or the amount of credit becomes unreasonable that problems develop, problems that often prove fatal to an exchange system.

Just like any currency, a credit clearing system collectivizes the credit of those who are required, either by law, or by agreement, to accept it. That means that credit is extended to buyers, not by sellers individually, but by all participants collectively. Thus, the risk that an account holder will default on their obligation to reciprocate is borne by all the participants together. The loss from a "bad debt" will be the community's loss, not the individual seller's. Consequently, credit lines, i.e., the privilege of overdrawing one's account, must be judiciously allocated, and the performance of each account, and of the system overall, must be carefully monitored.

2. THE ALLOCATION OF CREDIT

2.1 How Much Credit?

I agree with E. C. Riegel that it is better to allocate too much credit than too little, so that all desirable trades can be enabled. On the other hand, liberal allocation of credit increases the risk of "bad debt" losses. A mature and robust exchange system can absorb a substantial amount of defaults without suffering serious harm. However, experience over the past three decades has clearly shown that fledgling credit clearing systems cannot afford to be so liberal. The "pooling" of credits in the hands of the accounts whose goods and services are most in demand quickly results in frustration, disillusionment, and system stagnation or failure. It is essential to understand why this pooling occurs and how it can be avoided. Pooling has been more of a problem in community systems like LETS than it has in commercial trade exchanges that are operated as for-profit businesses whose owners cannot afford to ignore the hard business realities.

It is typical for newly established LETS and other community exchange systems to allocate the same amount of credit to each and every member. But most LETS members are individuals who derive their livelihood from regular employment, a pension, or a social program. What they offer for "sale" in the system is typically a non-essential service, and their motivation to provide it when requested may be relatively weak. Add to that the inconvenience factor in arranging a trade and obtaining delivery, and it becomes clear why these systems do not achieve significant scale or longevity.

The following example is typical of LETS and community credit clearing systems. Robert is a landscape painter who is offering to teach painting for LETS credits. Donald is a research physicist who works at a university research lab, but is offering guitar lessons in the system. Hector is a poet who is offering to tutor students in English composition. Isabel is a singer with a local band who is offering to sing at weddings and parties. Elaine is an office manager for a pharmaceutical company, but she is offering short-term pet care. There are dozens of other members who are in similar circumstances and are offering these kinds of non-essential services. Each has been given a 200 unit line of credit. The organizers of the system have also managed to recruit as members two regular businesses, a food store and an auto mechanic. As you can imagine, both are very popular and have had no trouble making sales within the system, and within a short period of time both have accumulated large credit balances. This is what is meant by "pooling." Finding little of what they need available within the system, they eventually decide to stop accepting LETS credits in payment.

The point is that established businesses find it easy to earn but hard to spend, while the majority of members, for whom participation in a credit clearing system is a sideline, find it hard to earn and easy to spend, at least until the business members drop out. It is imperative that steps be taken to avoid repetition of such failures.

Since in a credit clearing system the total of all credit balances must always equal the total of all debit balances, it is reasonable to ask, which accounts should typically be in credit (have a positive balance) and which should typically be in debit (have a negative balance)? Or, to express it another way, which accounts should be allowed to spend before they earn, and which should be required to earn before they spend?

2.2. Credit Clearing Exchanges Create Liquidity Independent of Banks

The power of mutual credit clearing systems lies in their ability to create local liquidity based on the collective credit of local enterprises. They do this by monetizing the value of local production in the form of a complementary currency or ledger credits. That is why I am arguing here that a

credit clearing system needs to allocate credit to producers in proportion to the amount of real goods and services they provide to the community. They are the ones who should be allowed to spend before they earn. In the above example, that would mean that the food store and the mechanic should create most of the credits in the process of paying their various suppliers, contractors, and workers. They are the ones that would be allowed to carry debit balances. All the other members in that example would be required to carry positive balances until they are able to demonstrate that there is a regular demand for the goods or services they offer, and that they are willing and able to satisfy that demand.

A new start-up exchange might give each non-business member a very small credit line, say 50 credits, to enable casual trades amongst them, but my advice is that they do not commence operations until they have lined up a significant number of local businesses to become "issuing members," to which they allocate the vast majority of the credit creation power. These credit lines to businesses will, at the outset, need to be based on their volume of local sales into the cash economy.

2.3. Allocation Criteria and Performance Measurement

The above discussion raises two further questions:

1. What specific criteria should be applied in making credit allocation decisions in order to assure timely reciprocation and avoid defaults?

2. How can we measure the performance of (1) individual accounts and of (2) the system overall?

Let us consider the second question first. It is evident that, in both cases, an outstanding balance (representing the amount of credits yet to be cleared) is meaningful only in relation to the amount of trading activity (sales and purchases).

Considering debit balances, a good measure of performance for an individual account is the *sales performance ratio*, i.e., number of days sales required to clear the balance on the account, i.e., to bring it back to zero. The *sales performance ratio* is computed by taking the average daily sales over some number of days and dividing that into the closing debit balance for the period. Such a measure will clearly reveal accounts that are stagnant or underperforming. We will consider later the question of what constitutes an appropriate time period for averaging sales.

Consider the following examples.

Case #1. Robert, when he joined a credit clearing circle, was given a 200 unit line of credit (overdraft privilege). On the first day, he purchased goods and services in the amount of 200 credits, and over the succeeding period of 90 days, he sold nothing. His ending balance for the period is -200 but his average daily sales amount to zero. Dividing anything by zero gives an indeterminate number but it approaches infinity. This is an example of a stagnant account, and in the process of reciprocal exchange, a stagnant account is a drag on the system. In this case, Robert has received value, but for whatever reason, has gone 90 days without reciprocating. That is unreasonable.

Case #2. Maria, when she joined, was also given a 200 unit line of credit. On the first day, she also purchased goods and services in the amount of 200 credits, but she has subsequently made dozens of additional transactions, both sales and purchases and, like Robert, has ended the period with a balance of -200. Her average daily sales for the period, however, amounted to 25, so her ratio of ending balance to average daily sales come out to -8 (-200/25) [the minus sign can be ignored]. This means that in the normal course of business, it would take her only 8 days to get her balance back to zero.

Maria's balance has been mostly negative during the period but that is OK, since she has been making a significant amount of sales. Her capacity and willingness to reciprocate has been well demonstrated by the sales she has made. There has been a healthy circulation of credits through her account.

Even an account that is persistently in debit (negative) is acceptable so long as there is a steady flow of transactions through it and its balance is modest in relation to its sales. After all, in a mutual credit clearing system, there must always be some negative balances to offset the positive balances, otherwise no trading is possible. It is only necessary to assure that the negative balances are within reasonable limits and held by those accounts that are willing and able to provide the community with a steady stream of the goods and services that the members need and desire.

2.4. Preventing excessive negative balances

We have already made the point that idle negative balances can be largely prevented by properly allocating lines of credit. Each account must be evaluated in terms of its ability and willingness to provide the members of the exchange with desired goods and/or services. The primary factor that must be used in making that assessment is the record of sales into the exchange by that account. So, what is a reasonable range of values for the *sales performance ratio*?

Disregarding the sign, it should be evident that a smaller number is better, but only to a point. A member should be able to clear their debit balance within a few weeks or perhaps months by making sales. An absolute maximum line of credit, based on past experience, would be the volume of sales made within the system over about a three month period. The technical term that applies here is the "reflux rate," i.e., the rate at which a previously issued currency or credit is being redeemed. In a credit clearing exchange the reflux rate is the rate at which a debit balance is being reduced as sales are made. Thus, the desideratum of a one percent daily reflux would mean that the entire debit balance could be worked off in the normal course of business in no more than 100 days, or roughly three months. Any larger ratio than this would indicate that the account has

been given too great a line of credit in relation to its actual sales performance.

In practice, especially in the start-up phase of an exchange's operations, a much smaller ratio on each account would probably be appropriate, depending on other criteria described below. The optimal ratio for an individual account is probably some number in the low tens, perhaps in the range of 20 to 50. The optimal level will need to be determined as more experience is gained in actual practice.

The average daily balance used in computing the ratio should be a "rolling average" covering some (rather arbitrary) time span. I like 90 days because it smoothes out weekly and seasonal fluctuations, but it could be 30 days, or 180 days or some other period appropriate to the seasonal patterns of the particular business. The calculation remains the same: take the most recent x number of days, compute the average daily sales over that period, and divide it into the ending balance.

2.5 Credit Allocation Criteria

Regarding credit allocation decisions, much can be learned from the experience of commercial trade exchange operators who have been successfully providing credit clearing services for many years. As an example, we might consider the *Credit Line Issuing Matrix* employed by *The Business Exchange*, a commercial trade exchange founded and operated for almost 20 years in Scotland by Richard Logie (see Table 1).

Furthermore, credit lines must be reviewed at regular intervals and adjusted upward or downward in accordance with actual experience and changes in the various factors that comprise the allocation algorithm. If a credit line needs to be adjusted downwards, purchases by that account may need to be restricted until the debit balance reaches the new reduced limit. On the other hand, increasing sales and a higher rating may justify an increased line of credit for an account.

Besides making every effort to avoid the occurrence of stagnant negative balances and defaults, the exchange must maintain a *reserve fund* or *insurance fund* (similar to a business' "reserve for bad debts") to cover any defaults that do occur. The exchange, of course, must have sufficient revenues from service fees to provide for this fund, as well as covering its normal operating expenses.

3. PREVENTING IDLE POSITIVE BALANCES

Consider another case.

Case #3. Karen is a member of the exchange, but since she has a regular job, does not operate a business, and has not yet demonstrated her earning ability within the system, she has not been given a line of credit. She is required to earn credits before she can spend. During the subsequent period of 90 days, however, she has started clearing out her closet and storage locker and has made a number of sales amounting to 450 credits. She has made no purchases so has ended the period with a credit balance of +450 credits, and her average daily sales is 5.11 (450/90) giving her a turnover of +90. But, in this case, it is turnover based on a positive balance.

Is this a meaningful measure, and what does it measure? A high level of sales into the exchange is always desirable since that indicates lots of real value being provided to the collective membership, so we always wish the denominator (sales) of the ratio to be large. The numerator represents an amount of value yet to be cleared, i.e., awaiting reciprocation. Whether negative or positive, we would always wish that to be as small as possible, but not so small as to inhibit trading. A positive account balance represents value due but not yet claimed. Excessive positive balances can be problematic in that those credits are not being made available to others who need to earn them, either to reduce their negative balance or to obtain credits they require to make purchases.

We should always keep foremost in mind that the fundamental objective of a credit clearing exchange is to facilitate *exchange*, not to provide a mechanism for *saving* or *investment.* It facilitates exchange by providing the trading community with liquidity based on short-term credit to "trusted issuers," so large idle balances, either negative or positive, are undesirable.

1. Rating of goods and services being offered	7. Years a member of the exchange
2. Exchange sales history	8. Fee payment history
3. Reputation as buyer	9. Complaint history
4. Reputation as seller	10. Exchange rating
5. Cash sales history	11. Credit bureau rating
6. Years in business	Note: You can get more detail on Richard's matrix by viewing his TEDx talk at http://beyondmoney.net/2012/11/04/complimentary-currency-systems-richard-logie-at-tedxleeds/

Table 1. Richard Logie's Credit Line Issuing Matrix

However, people do wish to save, and there is a need for long-term credit to finance investment in new business capacity. Is there some way that a credit clearing exchange might provide for these in a way that also discourages idle balances?

With regard to controlling positive balances, some have suggested that when some positive limit has been reached, that account should not be allowed to make further sales until the balance has been reduced (by spending). This approach is self-defeating in that a basic objective of the trade exchange is to bring as much real value as possible into the moneyless trading circle. Why would you want to block your most productive members from providing more of what the community has shown that it wants and needs? Of course, the exchange must also assure that the other members of the exchange are able to take up (purchase) that value.

Others have suggested that a fee be imposed on excessive positive balances to encourage spending and discourage the over-accumulation of credits. Sometimes called *demurrage*, or "negative interest," this fee amounts to a punishment or a negative incentive. A considerable body of research has shown that positive incentives are more effective than negative incentives in changing behavior. Let's reward "good" behavior, rather than punishing "bad" behavior.

What makes more sense to me is to first try brokering trades between accounts that have excess credits and others who need to earn credits. Beyond that, this "problem" presents an opportunity for the trade exchange to also assume another essential economic role which is to provide for savings and investment, or *intermediation* between savers and investors.

Just as in the political money system, some people will have a temporary surplus of credits that they will want to save for retirement or to make some large purchase sometime in the future. On the other hand, there will be others who need longer-term financing (start-up capital) to establish some productive enterprise that will add to the productive capacity within the community. Savings banks and credit unions typically provide such services in the world of political money.

In a credit clearing exchange, the needs of entrepreneurs might be automatically matched with available surpluses of credits by simply creating for each exchange member a "savings" account alongside their "trading" account. Trading accounts that reach some maximum positive balance can have their excess credits automatically shifted to that member's savings account. Thus, the account owner would lose nothing, but the amounts transferred to savings would not be available to the owner to be spent until some time has elapsed. That is because the savings will have been loaned or invested by the administrative body, and will not be repaid for some time.[1] Savings might also be allocated to finance the purchase of "big ticket" consumer goods like cars and major appliances.

In any case, a member can avoid that automatic transfer of credits to savings by investing their surplus credits themselves instead of allowing them to accumulate in their trading account.

4. SAVING AND WEALTH ACCUMULATION

At this point, something needs to be said about wealth accumulation. Your trading account balance in a credit clearing exchange does not tell the whole story about your economic condition. Credit clearing is only a transfer mechanism. In reciprocal exchange, in the long-run, you give as much as you get and get as much as you give. Your balance is simply a measure of how much value is yet to be reciprocated, either how much value you owe to the community (a negative balance) or how much you still have coming (a positive balance).

Balances are transitory, sort of like your checking account at the bank or credit union. When your balance is zero it does not mean that you are impoverished. You've simply used your credits to acquire something more permanent or useful. As you produce, you sell your product for credits; you use those credits to buy other products or services, so you are converting your own production into the things you want and need that are produced by others. You can also spend your credits to acquire claims against other people's future production (in the form of bonds, equity shares, etc.). This is the savings/investment function.

In my ideal world I would have NO lending at interest, not on the primary creation of *exchange credit*, nor on the savings and allocation of *finance credit*. I prescribe that investments be in the form of *equity shares* or *revenue shares*, not *debt*. Equity investments share both the rewards and the risks of a venture. However, some people will find ways to do otherwise. It will be the job of the membership to find ways of enforcing the rules, but if the majority of the funds are available on an equity or no-interest basis, few people will need to, or be willing to, pay interest.

Reciprocal exchange, when honestly and competently arranged, is capable of enriching everyone and promoting a more equitable distribution of our collective economic output.

5. TRACKING OVERALL SYSTEM HEALTH

Up to this point, we have been discussing the condition and management of the accounts of individual members of an exchange. Now let us turn to measuring the health of the system overall. We can apply the same *sales performance ratio* to determine the health of the system by looking at

[1] Anyone who has seen the movie, *It's a Wonderful Life*, will be familiar with actor Jimmy Stewart's impassioned speech to his bank's customers explaining that their money is invested in the community and not immediately available to be withdrawn. You can see it at http://youtu.be/EOzMdEwYmDU

the sum of all the debit account balances and comparing it to the aggregate sales of all members during a specified time period. So we first calculate the sum of all the sales by all the members of the system during the specified time period. We divide that by the number of days in the period to get the average daily sales. This will be the denominator.

We then calculate the sum of all the debit balances at the end of the period. This will be our numerator. Dividing the sum of all the debit balances by the average daily sales gives us the *sales performance ratio* for the system.

Consider the following two cases.

Case #4. The Alpha Trade Exchange has 500 members. Over the past 90 days, the total value of all transactions has amounted to 153,000 credits. That means 1700 was the average daily sales by all members in the system overall. The sum of all ending debit balances (uncleared transactions) over the period is 50,000 credits. This yields a *sales performance ratio* for the system equal to (50,000/1700) =29.41.

Case #5. The Beta Exchange also has 500 members, and over the past 90 days, it also has had a total value of all transactions amounting to 153,000 credits. That means it had a 1700 credit average daily sales in the system overall, the same as Alpha. The sum of all ending debit balances (uncleared transactions) over the period in the Beta Exchange is 130,000 credits. That gives Beta a sales *performance ratio* of (130,000/1700) =76.5.

Clearly, the Alpha Exchange is the healthier of the two exchanges. It is making more efficient use of the collective credit of its members. In each case, the same amount of value has been brought into the circle but in Beta's case, reciprocation is lagging behind. It is tempting to say that with regard to the sales performance ratio, "the smaller the better," but there is probably some optimal level that will be determined by experience.

For the moment, we can probably say with confidence that an overall *sales performance ratio* that is greater than 100 days, is probably indicative of too liberal a policy in allocating credit lines (overdraft privileges) and/or a membership composition that offers an inadequate proportion of the goods and services that are in everyday demand. On the other end of the scale, a *sales performance ratio* that is less than 10 is probably indicative of too restrictive a credit allocation policy.

6. PRIVATE CREDIT VS. COLLECTIVE CREDIT

The difference between private credit and collective credit can be illustrated by the following case.

Charles wants to buy a used car from Louise at the agreed price of 3,000 credits, but Charles' line of credit in the exchange is capped at 1,000. How might this transaction be enabled? There are several possibilities.

1. Charles can pay Louise by transferring to her his available 1,000 credits in the credit clearing exchange, and pay her the remaining 2,000 in dollars or other political currency.

2. Charles might apply to the credit clearing exchange for a loan of 2,000 credits to cover the shortfall.

3. Louise can accept the 1,000 credits from Charles within the system, and extend personal credit of 2,000 credits to Charles for the remainder, to be repaid as Charles earns credits by selling within the exchange.

This situation highlights the distinction between *collective credit* and *personal credit*. Credit lines provided within a credit clearing exchange are provided by the members collectively from the common credit pool. The risk of an account failing to reciprocate, i.e., the risk of non-payment (default) is borne by all the exchange members together. So if a member leaves the exchange with an outstanding negative (debit) balance, no individual member suffers the loss, but the loss must be made up by all the members together, presumably being written off against an insurance fund or *fund for bad debts*. On the other hand, when a member personally advances credit to another member, s/he alone must bear the loss if the loan is not repaid.

In the first option above, only a part of the transaction goes through the trade exchange. Since Charles has drawn upon his credit line of 1,000 credits, the entire membership is at risk of losing that amount if Charles does not pay.

In the second option, if Charles' application is approved, the entire membership will be at risk of losing 3,000 credits if Charles does not pay.

In the third option, the purchase of the car by Charles is being financed by a combination of collective credit and personal credit. In that case, the entire exchange membership is at risk collectively for only 1,000 credits, and Louise is at risk personally for the remaining 2,000 credits. If Charles drops out without paying, the collective membership loses only 1,000, while 2,000 is Louise's personal loss.

It would be highly advantageous if the software platform used by the credit clearing exchange could account for both collective credit and personal credit, providing for automatic payment on both as credits are earned. Thus, a member would have the option of making a sale in credits to their most trusted associates while providing an incentive for those associates to join the exchange. This was first suggested to me by entrepreneur and alternative exchange activist, Sergio Lub, toward the end of 2011. During the first quarter of 2012, we worked together with programmer, Devin Dombrowski, to lay out the user requirements for such a capability. It is our hope that this feature will soon be added to existing platforms that service an established user base.

7. SUMMARY AND PRESCRIPTIONS

Credit clearing is a process that enables reciprocal exchange without the use of conventional money or the need to take loans from banks. It achieves this by offsetting debits from purchases against credits from sales within a community of traders, all of whom are both buyers and sellers, both producers and consumers.[2]

The key to successful operation of a credit clearing exchange is the appropriate allocation and management of credit amongst its members.

The most important criterion in assigning lines of credit to the members is their ability and willingness to sell desired goods and services to other members and accept payment in system credits.

In assessing and maintaining the health of a credit clearing system, it is necessary to monitor the performance of both the individual accounts and the system overall. Useful metrics compare account balances in relation to sales averaged over some period of time. The metric herein proposed is the *sales performance ratio*, which is computed by dividing the outstanding account balance by the average daily amount of sales. This metric can be applied both to individual member accounts and to the system overall. The result can be interpreted as the number of days it would take in the normal course of business to clear the account balance, i.e., to bring the balance back to zero.

It is essential to recognize the distinction between *private credit* and *collective credit* and to understand the role played by each in commerce. Private credit is credit extended to a customer at the individual risk to a seller. In that case, the seller bears the risk of loss in case the buyer fails to reciprocate. On the other hand, the use of any currency, other than a commodity currency, collectivizes credit and puts the entire community of currency users at risk in case of non-reciprocation. Such is also the case within a credit clearing exchange. Credit lines extended to members within a credit clearing exchange put the entire membership at risk in case a member with a debit balance fails to reciprocate, i.e., s/he fails in the long run to make enough sales to offset purchases.

Given the above considerations, trade exchange administrators must recognize that they are acting on behalf of the membership as a whole, and decisions about credit allocation put the entire membership at risk of loss, and the system at risk of failure. A well thought out credit allocation policy, based on appropriate criteria, must therefore be carefully and transparently worked out with the involvement of the members. Further, there must be adequate oversight by the members to assure that that policy is being properly and impartially implemented.

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[2] Alvin Toffler has coined the term *prosumer*, which seems applicable in this case.