

Triple Bottom Line: The Economic Systems Infrastructure for a Sustainable and Abundant Service Economy

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The primary goal of the industrial revolution was to increase the production and reduce the cost of material goods. Supporting technological innovation was a key factor in the success of the industrial revolution. Our monetary and financial services institutions have clearly proven successful in achieving these goals. However, the culminating technologies of the industrial revolution—information and communications technology and biotechnology—have thrust us into a new postindustrial era in which services are the primary basis of economic growth and where new economic theories and accounting conventions are needed.

This does not mean that industrial production or conventional accounting systems are obsolete. It only means that we have sufficient material productive capacity to satisfy our basic human needs, and that we need to look for new, ecologically sustainable, arenas for economic growth. In relation to accounting systems it is necessary to modify our concept of money as the unit of account so that we can more effectively satisfy the full range of human needs, as defined by Abraham Maslow's (1954) hierarchy: physiological, safety, love and belongingness, esteem and self-esteem, and self-actualization. Since the systems that satisfy the different levels of the hierarchy operate according to different system dynamics, it is necessary to use our greatly expanded capacity for processing information to develop accounting and planning systems that are adequate to this variety of systems dynamics.

The established economic system, supported by price-auction market economics, was designed to foster the industrial revolution. The foundation of this is a monetary system that creates currencies that are designed to be scarce and competitive, to promote the concentration of tangible assets, and privileges exploitation of the environment over sustainable investment practices. Conventional national currencies are mostly created in the form of new bank accounts created by interest-bearing loans. Since the interest to repay the loans is never created, an element of necessary scarcity and competition pervades the system and ultimately leads to the concentration of real assets, particularly in times of economic recession when loan collateral is called in and those who control large quantities of liquidity have an advantage in relation to those who control little. The fact that much of the creation of real capital, particularly in small businesses, is encumbered by debt leads to the need for unsustainable levels of economic growth. The fact that interest is also paid on savings accounts means that risk-free investment in savings accounts competes with real wealth based investment in technology and natural resources. This leads to an accounting convention which discounts the value of assets (including natural resources) in the future and leads to privileging short-term over long term returns. The fact that different national currencies have different real asset values

leads to a situation in which currencies become a commodity. Currency exchange adds some real value to the dynamics of international trade. However, we have reached a situation in which destabilizing currency speculation accounts for more than 98% of international currency commodity transactions; this is clearly a case of the tail wagging the dog. Society clearly continues to want the benefits of technological innovation and global trade. However, as the negative ecological and social side effects of the conventional system become increasingly apparent, we face an increased incentive to look for alternatives. As will be discussed at greater length below, an alternative is to view money (the basis of economic liquidity) as a public utility, rather than as a commodity. (This paragraph is largely based on B. Lietaer, *The Future of Money*, 2001)

We have entered a new era that requires new economic theory and new economic institutions. It is becoming necessary both to model the systems properties or ecological characteristic of the various domains of productivity and to design monetary and financial services institutions that optimize productivity in these domains. This paper is primarily focused on the issue of the design of economic (monetary and financial services) systems. It argues that theory and institutions should be based on the concept of a triple bottom line¹:

- Sufficient material goods
- Sustainable ecological systems

Optimal quality of life, based on the abundance of personal and community-oriented services

Productivity in each of these domains operates according to different systems principles which need to be modeled and accounted for in economic terms. These terms include different definitions of bottom line assets. Each of these bottom lines is *economic*, that is it must be accounted for in quantitative or financial terms. With appropriately defined or

¹ According to Wikipedia, “

In practical terms, triple bottom line accounting usually means expanding the traditional company reporting framework to take into account not just financial outcomes but also environmental and social performance. The phrase was coined by John Elkington, co-founder of the business consultancy SustainAbility, in his 1998 book Cannibals with Forks: the Triple Bottom Line of 21st Century Business. (Wikipedia, 2006)

The concept is part of the Corporate Social Responsibility Movement, and the three bottom lines are conventionally defined as profitability, sustainability, and social justice. The definition adopted in this essay recognizes three domains of productivity, all of which should which should generate ‘profits’ to individuals and/or society. This approach deals with many of the objections that have been raised against the concept.

constructed monetary units, the conventions of double-entry bookkeeping can be used to track profits and losses, assets and liabilities. However, privileging the accounting system defined by any one of these domains of wealth and well-being will lead to distortions of productivity as defined in the others. This is the problem created by conventional economics, which privileges wealth defined in terms of the accumulation of material goods and the associated financial capital.

II

The established economic system was designed to foster the industrial revolution. It encourages innovation, the exploitation of natural resources, and the accumulation of material wealth. Conventional economic theory identifies land, labor, and capital as the factors of production. Land is valuable as the exploitable source of natural resources and energy. Labor is seen as a cost factor in the production of material goods that industrial capitalism strives to minimize. Capital has two meanings: On the one hand, it refers to financial capital as the basis of a power structure that supports the exploitation of natural resources and labor. On the other, it refers to ownership of the physical technology (capital goods) that promotes innovation and the reduction of the cost of material goods. Market economics is designed to explain and support this system and its values. Wealth is defined primarily as the accumulation of material assets, although personal services are also seen as marketable goods and the ability to command them in large quantity is an aspect of wealth. Privileging the definition of wealth embodied in this system leads to a society that is awash in tangible material goods and starved for intangible public goods. This dilemma was identified by John Kenneth Galbraith in his 1958 book, *The Affluent Society*, but the solution has continued to elude us.

The purpose of economic systems should be understood as serving the satisfaction of the full range of human needs (as defined by Maslow's hierarchy). Whereas the lower needs in the hierarchy require material resources and can be served by market mechanisms, the higher needs are satisfied by human relationship resources. These resources are therefore in principle abundant. They are not subject to the growth-constraining limits imposed by the finite character of natural resources, and they need to a great extent to be organized in terms of an economics of the commons.

The generic strategy for the production of higher need satisfaction is education, supported by technology. From a macroeconomic perspective recognizing positive human relationships as assets, the only costs are negative human relationships and the depletion of natural resources. Everything else is the production of value (legitimate) or the appropriation of value by what Robert B. Reich calls "paper entrepreneurialism" (illegitimate).

III

Creating appropriate economic institutions for a postindustrial world requires us to recognize a few basic principles:

“Money is an agreement, within a community, to use something as a means of payment [medium of exchange]” (Lietaer, 2001, p. 41). The “something” used is what we commonly refer to as “money,” but it has its value on the basis of social agreement, not intrinsic worth. The specific design features of a monetary system have practical consequences.

There is an economics of the commons (public goods and services, sustainable ecology, quality of life) that is different from and complementary to the economics of price-auction markets (which produce trade goods and services).

In the economics of the market system, land (natural resources) is accounted for as a cost factor in the production process. More recent thinking has pointed out that the earth is an asset which can be managed in ways that deplete or sustain its value. This has led to concern with the need to account for “externalities.”

In the economics of the market system, human labor (including intellectual as well as manual labor) is also treated as a cost. In the economics of the commons, human creativity and relationships are intrinsic forms of wealth. Shifting from a view of human resources as costs to a view of human labor, creativity and relationships as assets (intrinsic forms of wealth) leads to new approaches to accounting for value and is key to the creation of an abundant, information-rich service economy.

IV

The Design of Complementary Currencies

Money is created by an agreement within a community to use something countable as a medium of exchange. Money has value only within a society where it can be used to purchase tangible goods and services. Shipwrecked on a desert island, a trunk full of money, whether it is gold or currency, is of little value. (The currency could be burned for warmth.) But as Lietaer points out, money lives in the same realm of social agreements as marriage or national identity.

The primary function of money is to provide a community with a fungible information system standardizing measurements of value in order to facilitate trade. However, this liquidity also facilitates economic transactions such as public services. In other words, the primary function of money is to provide a trading community with liquidity. (The other function of money generally recognized by economists is to serve as a *store of value*. We shall return to this second function below, but it can be noted here that both functions come together as a unit of account in a double entry accounting, with its balance sheets and profit & loss statements.) As noted above, the design characteristics of conventional currencies were effective in promoting the industrial revolution. However, we are increasingly coming to understand that they generate undesirable and unsustainable side effects.

Table 1 from Bernard Lietaer’s *The Future of Money* (2001) provides an overview of the variety of mechanisms for creating currency currently in operation. As of 1998 there were over 3500 alternative or complementary currency systems in operation world wide (p. 159). Note that the only system in the chart that is not actually in operation is the

ROCS, which is Lietaer's model for a system that would incorporate all of the most desirable design features. Also note that the oldest and largest system, the Swiss WIR, does over \$2 billion worth of annual transactions and has been shown to have a countercyclical, stabilizing effect on the Swiss economy.

There are two main types of issuing mechanism: Fiat currencies and mutual credit systems. Fiat currencies come into being by virtue of an issuing authority; conventional national currencies all fit into this category. For US dollars, the Federal Reserve System attempts to control the quantity of currency in circulation primarily by adjusting interest rates and reserve requirements. The other principle type is the mutual credit system. Mutual credit systems have the advantage that the money supply is largely self-regulating. In a manner analogous to double entry bookkeeping for a firm, each transaction simultaneously generates a credit and a debt entry. In a community scale trading system, the money supply can be controlled by transparency. One does not do business with a member who is too far in debt.

All of these alternative currency systems should be considered “complementary,” as no community has used a system as a complete alternative to conventional national currencies. Lietaer makes the distinction between conventional “yang” currencies and complementary “yin” currencies that support social and ecological values. Several models of dual currency economies that imply parallel accounting systems and multiple bottom lines are already in effect. Ithaca Hours in New York State is probably the best-known complementary currency system in the United States. There are several versions of LETS system (first developed by Michael Linton in Courtenay, B.C.) in operation around the world. Edgar Cahn, in his book *No More Throw Away People* (2004), argues that Time banking is essential to support the “Core Economy—of family, of neighborhoods, of community, of civil society” (p. 204). (It is worth noting that it was not until the second edition of the book that Cahn shifted from the terminology “non-market economy” to “Core Economy.”) Lietaer and DeMeulenaere (2002) document the role of a time-based complementary currency system in maintaining the health of Balinese society and its resistance to the negative impacts normally associated with global tourism. In a talk sponsored by the Praxis Peace Institute entitled “Sustainable Development Today: The Monetary Dimension” (2005), Lietaer compares the successful Balinese Temple Time system with the disastrous effects of the “hut tax” imposed by the British in Ghana. In a study entitled *Private Development Banking: Managing the Tensions*, economist David Porteous contests the conventional wisdom that pursuing a double bottom line (striving for financial and social profits) means sacrificing the former.

Table 1. Comparative Table of Various Currency Systems (Lietaer, 2001, p. 232)

	<i>Unit</i>	<i>Issuance</i>	<i>Details</i>	<i>Main Benefit</i>
National Currencies	US\$, euro, yen pound (mediated via US\$)	Fiat currency issued by banks supervised by central bank	Debt-based Bearing interest	Legal tender
LETS	1 Green \$ = 1\$	Mutual Credit	Most prevalent current system	Easy pricing (because unit = \$)
Time Dollars	Hours of Service	Mutual Credit	Fixed exchange rate: 1 hour = 1 hour	Simplest system
WIR	1 WIR = 1 SF	Mutual Credit+ Loans from Centre	Fiat currency	Most mature system (\$2 billion/year)
Ithaca HOURS	1 HOUR = \$10	Fiat currency issued by community 'pot luck' centre	Quantity must be managed	Ease of use (paper bills)
Japanese Healthcare	Hour of Service	Non-profits governments	Local National Clearing House	Caring Service at no taxpayers' cost
Taloc	1 Tlaloc = 1 Mexican peso	Mutual Credit	Issuance by cheques	Low tech (no computer or telephone needed)
ROCS (Robust Currency Systems)	Hour of Service	Mutual Credit	Negotiated exchange rate Demurrage charges	Synthesis of most robust features

The Economics of The Commons

The concept of the triple bottom line is gaining currency in the sustainable business community. In this model, the three bottom lines are:

- Profitability
- Sustainability
- Social Justice

A look at the systems properties of productive sectors in the economy suggests an alternative model based on accounting for the production of real wealth in the material, ecological, and social or human sectors. As indicated above, the three bottom lines would thus measure productivity in terms of:

- Sufficient material goods
- Sustainable ecological systems
- Optimal quality of life, based on the abundance of personal and community-oriented services

As noted above, price-auction market economics and conventional capitalist economic institutions have been focused primarily on the production of material goods and secondarily on the production of marketable services. Thus the financial bottom line has been biased in favor of over production of marketable goods and services at the expense of creating wealth in the other two sectors. Both of these sectors are aspects of an economic commons² that includes all resources, goods, services, and assets that must be produced and/or consumed (used), at least in part, collectively.

In other words, the commons includes all social system and ecological system assets essential to, or useful for, human wealth and well-being that cannot be produced and/or distributed to individuals operating in price-auction markets. The consumer, and often the producer, is necessarily a collectivity. Historically, the collectivity was often established by tradition. However, as the pace of social evolution has increased, decisions about collective production and consumption increasingly need to be made

² The term "commons" was first popularized by Garret Hardin's article "The Tragedy of the Commons" (1968). In 1958, John Kenneth Galbraith observed that modern industrial societies are awash in private material goods and starved for public goods. It is remarkable how little has changed in half a century. In the 19th century Henry George (1879) argued that the wealth created by social organization per se should be taxed to fund social purposes.

consciously through some political process. These decisions can be made democratically or by dictatorships. They can be made by governments or by voluntary community agreements that include nonprofits and other forms of philanthropy, and also by voluntary risk-pooling as with insurance and mutual funds.

Today we find that most aspects of the commons, ranging from the integrity of the environment to the social fabric of our communities, are in a state of crisis. This is because we simply do not know how to think about the economics of these critical systems, including politics, health care, education, public safety, retirement security, employment security, energy, transportation, environmental quality, land use, affordable housing, and culture and the arts. Many productive sectors, including for example health care and education, create value for both individuals and the community.

The economics of the commons is fundamentally different from the economics of markets because it requires the intervening step of a collective purchasing decision. Unfortunately, the economics of the commons does not include an elegant self-regulating mechanism comparable to the "invisible hand" of price-auction markets that serves the economics of commerce so well.³ Our relationship to the commons is characterized by mechanisms that operate according to rhythms and orders of conceptual complexity that are different from those governing markets. In the long view of history, the commons has primarily been managed by the largely unconscious (or more accurately, embodied in iconic and narrative consciousness) hand of incrementally evolving tradition. Since the Renaissance, it has become increasingly the province of the conscious hand of politics, which is ideally guided, though often misguided, by reason. These political processes are widely recognized as vulnerable to whim and corruption. The increasing domination of politics by economic power has led an increasing bias in the direction of short-term economic interests in our approach to issues related to the commons. In particular, it has led to an ideological emphasis on the reliance on markets as the solution to all economic and political problems. This in turn has tended to obfuscate our efforts to respond politically to the negative ecological side effects of industrial production and to directly address pressing issues of social equity and cultural pluralism. However, information technology also gives us the historically unprecedented ability to examine and interpret the fine structure of the commons in ways that could conceivably enhance our ability to make informed political decisions. The possibility of parallel or complementary accounting systems offered by the concept of a triple bottom line presents us with the possibility that wealth generated in the forms of ecological sustainability and quality of life could gain recognition comparable that which conventional capitalism accords to material productivity. It should be emphasized that this does not imply the overthrow of capitalism. On the contrary, it implies extending the basic logic of capitalism (the relationship between savings and investment, as embodied in the second, store of value,

³ Osborne & Gaebler (1992) propose that public spending decisions could be made more effectively if there were a clearer distinction between production and consumption decisions. In their model, the primary legislative function would be to determine the need for public goods and services. Providers would bid to provide the desired services, and they could be government organizations, nonprofits, or private businesses.

function of money) according to democratic principles and humane values. (Cf. Gates, 1998, and Turnbull, 1975).

VI

The Triple Bottom Line and Currency Design

The goal of triple bottom line accounting is to:

- Optimize the production of trade goods,
- Maintain sustainable ecological systems,
- Encourage an abundance of well being in the arena of social relationships.

Each of these goals implies planning as well as accounting. Implementation of the triple bottom line concept will require parallel accounting and planning systems. There are three appropriate types of accounting (actually, money) systems⁴ that are needed for efficient optimization of the triple bottom line concept:

- Conventional national currencies,
- Complementary regional currencies,
- Time Banking.

Simplifying and amplifying Table 1 and using the Sonoma County-based CSD (Community Support Dollar Project) as the prototypical regional currency, Table 2 summarizes these three types of currency. Both complementary currencies are mutual credit systems, thus avoiding the asset concentrating and ecologically unsustainable design flaws in debt-based interest-bearing conventional national currencies.

Regional currencies have the benefit of increasing local trade and stabilizing the business cycle. The most dramatic example of this is the Swiss WIR system. Other well known examples of regional currencies include Ithaca Hours and various LETSsystems. It should be borne in mind that we are already using many other types of alternative currencies, without necessarily thinking of them as alternative forms of money. This includes such things as frequent flyer miles and customer loyalty discounts. It also include scrip systems operated by the Catholic Church and other nonprofits. And it includes the commercial trade barter movement among small businesses. There are more than 500 commercial barter networks in the U.S. and more than 1500 worldwide (Annette Riggs, personal communication).

⁴ Theoretically, the goals of triple bottom line accounting could be accomplished using only one accounting system based on one type of currency. However, this would require a thorough overhaul of the conventions for the creation and management of conventional currencies.

Time Banking can mobilize marginal productivity as defined by markets (un-and underemployed labor) and by personal choice (individuals who choose to contribute some of their marginal productive capacity to the commons), particularly to increase the output of the low-tech common sense labor needed to sustain what Cahn calls the Core Economy. As will be discussed in greater detail below, public policy and voluntary social contracts are needed to maximize productivity in the ecological and social commons.

However, the situation is not so simple that the each of the accounting systems correlates in a one-to-one fashion with one of the bottom lines conceived in terms of the three areas of productivity goals.⁵ Conventional and complementary currencies have a role to play in achieving each of the three productivity goals.

Table 2. Major Types of Currency Systems

	Unit	<i>Issuance</i>	<i>Details</i>	<i>Main Benefits</i>
National Currencies	US\$, euro, yen pound (mediated via US\$)	Fiat currency issued by banks supervised by central bank	Debt-based Bearing interest	Legal tender
C\$D	1 C\$D = 1\$	Mutual Credit, Community Service Corp.	Most prevalent current system; debit cards, online accts., paper bills	Easy pricing (because unit = \$); sufficient liquidity; pro sustainability, social justice
Time Dollars	Hours of Service	Mutual Credit; Non-profits	Fixed exchange rate: 1 hour = 1 hour	Simplest system; tax exempt in U.S.; promotes contribution of marginal productivity to commons

⁵ My colleague Larry Davis has proposed a planning model based on using complex adaptive systems (CAS) theory to create future scenarios for four key macrosystems: economics, technology, ecology, and culture. From the perspective of this essay, economic systems would be modeled using three types of currency: conventional currency, regional currency, and time credits. Technology is key to both optimizing the production of trade goods and maintaining sustainable ecological systems.

But planning and accountability in the three productivity areas require looking at the bottom line in at least two, and sometime all, of the accounting (money) systems. In addition to parallel accounting systems, planning to realize these productivity goals requires an understanding of the dynamics of the social, technical, and ecological systems that produce or create wealth in each of these arenas, as well as an understanding of complementary currency design. In addition to improving the performance of the market economy, this understanding can lead to public policies and voluntary social contracts that can use the design characteristics of various types of money systems to optimize individual and collective wealth and well-being.

In the arena of public policy, one goal is to optimize the production of marketable goods and services, but public policy also seeks to optimize the sustainable productivity of the ecological and social systems that make up the commons. The concept of the “bottom line” implies tangible, measurable returns to the individual and/or firm in the form of transient (consumable) values and/or durable assets. Complementary currencies offer the possibility of defining measurable and negotiable returns on investments in the ecological and social commons, as well as in market-oriented production.

A bottom line requires that all transactions in an accounting system can be valued in terms of a uniform unit of account (money). The concept of a triple bottom line requires that the units of account (money) be designed according to different principles for each of the three bottom lines. While money is created by an agreement within a community, that agreement should be made in the light an understanding of the consequences of adopting particular design principles. Different designs privilege different values in their bottom line, and the concept of the triple bottom line expresses the social desirability of balancing the values of material consumption, ecological sustainability, and intangible quality of life.

For a community to enter into an agreement requires trust. The guarantor of trust in traditional currencies is that fact that they are “backed” in such a way that the holder of a currency is confident that it can be “spent” at will. Traditionally gold was the preferred backing because it was universally recognized as a valuable commodity. Since the US dollar was taken off the gold standard, its backing (and the backing of other national currencies backed by the dollar) is simply the full faith and credit of the U.S. government. In a mutual credit trade system, the currency is backed by the productive capacity of the community, which is why a successful mutual credit system requires a sufficient diversity of members. Optimizing returns in the ecological and social arenas of the commons, as well as in the price-auction market, will require public policies and voluntary social contracts that create measurable bottom line benefits in each of the three areas. However, these returns can be defined and quantified in terms of collective production and consumption, as well as in the terms familiar to traditional price-auction market economics.

Complementary currencies inherently imply at least a dual accounting system: one that tracks transactions in conventional national currency and one that tracks transactions in the complementary currency. The purpose of all complementary currency systems is to

mobilize underutilized productive assets. This often means increasing marginal productivity. The concept of a “triple bottom line” suggests that public policies and voluntary social contracts can incorporate complementary currency systems to encourage balanced and sustainable production of tangible and intangible forms of wealth and well-being. In triple bottom line accounting, these arrangements should produce measurable returns to individuals and firms, as well as to society at large. These returns will be tracked by multiple, parallel accounting systems based on conventional and complementary currencies. However, the benefits in each of the areas of material consumption, ecological sustainability, and intangible quality of life may show up in the bottom line of more than one accounting/currency system. These often reflect interaction effects among markets, public policy, and voluntary social contracts.

Optimizing Trade. For the purpose of optimizing trade in price-auction markets, conventional currency is often sufficiently available. When it is not (when an economy is a recession or depression), a mutual credit system can provide needed liquidity. Thus ameliorating the effects of the business cycle and encouraging local business are the primary goals of basic complementary currency systems such as LETS, Ithaca Hours, or WIR. Research has shown that the WIR, which operates at a volume exceeding the equivalent of \$2 billion, exercises a countercyclical effect in stabilizing the Swiss economy. (Stodder, cited in Lietaer, 2003, p. 202)

Creating Ecological Sustainability. Green business practices have proven to be profitable in the market place for many businesses using only conventional currencies. *Natural Capitalism* (Hawken, Lovins & Lovins, 1999) explores many of these possibilities. Participating in a complementary currency system has the added advantage of supporting a currency system that does not embody the unsustainable and ecologically destabilizing design features of conventional money.

However, maximizing the potential of the ecological bottom line requires recognizing that ecological sustainability participates in the economics of the commons as well as the economics of markets.

The economics of the commons requires public policies that achieve two functions:

- Provide goods and services the community needs and wants as a collectivity.
- Translate the cost of what economists call “externalities” into costs that are operative in the price-auction market.

These are the primary economic functions of governments. However, voluntary social contracts, implemented through non-profits and other more informal voluntary social arrangements, also have a role to play.

In the area of the ecological bottom line both of these factors come into play. The public has generally indicated that it wants and is willing to pay for an ecologically sustainable environment. It is up to government and political leaders to translate this into political will and appropriate economic policies. In his book *Plan B*, Lester Brown (2003) of the Earth Policy Institute offers a comprehensive systematic summary of the range of policy areas that need to be addressed in order to achieve sustainable strategies for economic

development. He surveys crises in the areas of water and cropland shortages, global warming, and the negative environmental consequences of the growth of grinding poverty. And he offers a menu of feasible policy initiatives that have implications for action at the local, national, and global levels. Public policy and public funds need to support and coordinate investment in environmental assets that do not lend themselves to profitable market investments. Voluntary initiatives such as the land trust movement have demonstrated that private philanthropy can also play a major role. Progress in the areas of sustainable energy, agriculture, and forestry is demonstrating that coordinated public, private, and philanthropic investment can create profitable market-based productivity.

“Externalities” is the name economists give to those costs to the environment and the community that are inadvertently generated by market activities. These include pollution and its consequences, such as global warming and acid rain, and the depletion of natural resources including water and soil as well as oil. A comprehensive program of taxes and fees to recover the full costs of externalities would be fair and conducive to sustainable business practices and personal behavior. Henry George’s 19th century proposal for land value taxation (the “single tax”) would promote sustainable development and land use by taxing the value added to the land by the collective productivity of society. (Under George’s proposal, improvements would not be taxed as these represent productive investments by individual landowners.)

All of these strategies can be implemented using conventional national currencies. Many of them could be implemented at the local level to address regional environmental issues. However, at the regional level the effectiveness of environmentally oriented taxes and fees could be leveraged by making them payable in either national or regional currency since well-designed complementary regional currencies are environmentally friendly. In addition, they promote local business stability and the use of underutilized local resources.

In addition, there have been a variety of proposals to create natural resource-based currencies. Lietaer (2001) has proposed the *Terra* as a stable currency for international trade backed by a basket of commodities. Governments could implement a complementary currency by spending on ecologically desirable projects and closing the cycle by collecting pollution fees in that currency. This spending-taxing cycle would reverse the conventional taxing and spending cycle in which government competes for inherently scarce national currency. Accepting the payment taxes and fees in either conventional or complementary currency would support a currency system built on sustainable assumptions.

Maximizing Quality of Life. As is the case with the environmental bottom line, many of the relevant goods and services (particularly services) can be provided by government and philanthropy using conventional currencies. However, history suggests that these services will continue to be chronically in short supply as long as they are based exclusively on conventional currency. Complementary currencies such as scrip and profit sharing credit cards have already been implemented in many communities in the attempt to address this shortfall. A complementary regional currency system designed

primarily to support a healthy regional market economy can also be fine tuned to support education, health care, social services, and other regional public goods and services.

In addition, the use of Time Banking (Time Dollars or Time Credits) as documented by Edgar Cahn in *No More Throw-Away People* (2004) has proven useful in a variety of contexts that support and enhance the value of community:

When we look at what [market] price does, we see that it effectively devalues everything that defines us as human beings. It devalues all of those capacities that are not scarce; yet those capacities, the ones we all share, are what enable our species to survive. If something is worthless because it has no market value, look at all the capacities we are devaluing:

- caring for each other
- coming to each other's rescue
- rearing infants
- protecting the frail and vulnerable
- standing up for what is right
- opposing what is wrong
- coming together to reach agreement
- acting as guardians of whatever we feel is precious and want to pass on to our children and their children. (pp. xiii-xiv)

Table 3 documents some specific successful applications of the Time Banking concept.

In the United States, one of the advantages of a Time Banking system is that the accounting procedures are simple. The currency unit is an hour of service, and this type of system has been declared tax-exempt by the IRS. Since in a Time Banking system, everyone's hours are of equal value, the use of such systems is clearly complementary. They do not compete with currencies that are designed to support bidding in price-auction markets. However, Time Banking maximizes the mobilization of resources that are outside of the market economy, either as involuntary un- or under-employment or as voluntary pro bono activity.

Time Banking is designed to promote low tech services requiring a common sense skill level. The Time Dollar model was originally designed to encourage senior citizens to care for one another in way that would keep them out of nursing homes. Japan has developed a similar nationwide system that encourages participation in elder care in order to earn credits that can be saved for future need or used to obtain care for relatives in other parts of the country. However, it has been extended to other arenas. More recently, Cahn has developed the concept of "co-production" to recognize the fact that in helping relationships value is co-created by the giver and the receiver. He has also come to recognize that what he originally called the "non-market economy" is actually a "Core

Economy” of collaborative relationships that are the foundation of family, neighborhood, and community life.

Lietaer and DeMeulenaere (2002) have reported on the value of temple time—essentially a time tax—in supporting the vitality of Balinese society. A great deal can be accomplished by voluntary associations using Time Banks. However, a time tax has the virtue of being inherently progressive. If a surgeon and a gardener are required to contribute equal amounts of hours to the community,

the value of the hours would result in a progressive taxation based on the market value of each one’s hours of service. An individual could be permitted to “buy out” his obligated hours at the hourly rate for his/her services. At the same time, because these hours represent marginal productivity, the cost to the individuals may not be as far apart as the market value of their labor would suggest.

VII

Accounting Beyond Bookkeeping

The concept of triple bottom line accounting implies multiple accounting systems for firms and individuals. But in computing the triple bottom line, firms and individuals should include assigning value to assets held as part of the commons. In the ecological ledger, these assets include reasonably priced and reliable access to food, water, energy, air quality, health care, and transportation. It also includes environmental aesthetics and access to open space and wilderness. In the human relationships ledger, assets include participation in community, economic security, access to education and social support services, and public safety.

Since conventional currency is designed to be scarce and to foster competition, the use of complementary currency systems is essential to assuring an adequate supply of communal assets. (Complementary currencies are designed to be sufficient, not ‘abundant’, since too much currency in circulation leads to inflation.) Assuring an adequate supply of communal assets requires the mediation of public policy. These policies can be established by governments, but they can also be established through voluntary social contracts, as with land trusts and community foundations. The policy framework using complementary regional currencies can be based on a combination of taxes, fess, and philanthropy. Institutional arrangements can be based on principles of sophisticated ecological science as well as on the social justice principle that a certain portion of the trade economy should be redirected to social purposes, including a social safety net.

The bookkeeping associated with the three types of currency systems is straightforward. However, there are no easy formulas for dealing with the larger accounting principles involved in creating the triple bottom line. Each community, firm, and individual has to negotiate the relationship between its values and its social and ecological environment in order to create accounting valuations that give depth and specificity to the triple bottom line concept. That is a subject for another essay, perhaps by someone whose area of expertise is organization development.

Table 3. Numbers with a Heart (Reprinted from Edgar Cahn, *No More Throw-Away People*, Washington, DC: Essential Books, 2004.)

Worldwide Time Dollar Census: As the millennium dawned, 70 communities in Great Britain, Japan, and the United States had registered programs on the Time Dollar web page (www.timedollar.org).

Health Care for Seniors: Elderplan (rated #1 HMO in New York in 1999) recorded 97,623 Time Dollars earned by senior members serving 4,316 members through 41,985 care-giving episodes. The program yielded a 1999 Points of Light award.

Management: A Virginia HMO's asthma management program using Time Dollar members resulted in a 39 percent drop in Emergency Room visits; an 80 percent drop in in-patient days; a 74 percent drop in hospital admissions; and \$80,000 saved in Year 1 and \$137,500 in Year 2.

Legal Services For Communities: In exchange for Time Dollars earned by the community, Holland & Knight provided \$231,000 in legal services to help local residents close crack houses, keep the neighborhood school off the closing list, and get funding released to clean up JFK Playground.

Juvenile Justice: Youth Courts run by teen jurors earning Time Dollars now handle more than one-third of all non-violent first offenders (juveniles) in Washington, D.C. Sentences include community service, restitution, jury duty, and an apology. Jurors cash in Time Dollars for a recycled computer.

Public School Tutoring: Utilizing Time Dollars, Chicago Public Schools boast the nation's largest after-school cross-age peer tutoring program. Now in its fourth year, it has spread to 25 schools; older students tutor younger students and earn Time Dollars. In 1999-2000, 1,500 students will earn enough to secure a recycled computer.

Rent in Public Housing: In Baltimore's Hope VI project, 8 Time Dollars per month are part of the rent. One hundred and fifty households are providing help to each other, to the local school, and to their community. Families use Time Dollars to buy a bus pass, discounts at shops, furniture, clothing, and membership at the Boys and Girls Club.

Citywide Neighborhood Services Program: As of November 4, 1999, the St. Louis Grace Hill Neighborhood Services program had recorded 12,378 exchanges involving 42,519 Time Dollars at 10 sites encompassing 33 neighborhoods. Projected 1999 year-end total = 70,000.

Food Bank: With monthly dues of 10 Time Dollars, a Food Bank club generated 78,000 Time Dollars by helping neighbors. Membership meant food at the end of the month in 18 Washington, D.C. public housing complexes.

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Appendix A

Key Concepts of Complementary Economics

Money is an agreement, not a thing. Money is created by an agreement within a community to use something countable as a medium of exchange. The specific design features of a monetary system have practical consequences.

There is an economics of the commons (public goods and services, sustainable ecology, quality of life) that is different from and complementary to the economics of markets (which produce trade goods and services).

In the economics of the market system, human labor (including intellectual as well as manual labor) is a cost. In the economics of the commons, human creativity and relationships are intrinsic forms of wealth. Shifting from a view of human resources as costs to a view of human labor, creativity and relationships as assets (intrinsic forms of wealth) leads to new approaches to accounting for value and is key to the creation of an abundant, information-rich service economy.

A More Complete List of Principles of Complementary Economics

The purpose of economic systems is the allocation of resources to the satisfaction of human needs and desires. Therefore, economic systems must be assessed in terms of the ethical criteria of their effectiveness in performing this task.

The design principles of specific economic systems have practical and moral consequences.

Money is an agreement, not a thing. Money is created by an agreement within a community to use something countable as a medium of exchange. The specific design features of a monetary system have practical consequences. (Lietaer, 2001; Greco, 2001)

The two functions of money are to serve as 1) a medium of exchange, and 2) a store of value.

Money as a medium of exchange serves to facilitate real time exchange transactions within a community. The primary criterion of the effectiveness of a monetary system is sufficient liquidity.

Money as a store of value is the accounting for savings and investment. According to macroeconomic theory, in order to avoid recession—that is, an insufficiency of liquidity in the exchange system—savings must equal investment. (Keynes) This is the function of financial services institutions.

Investment is the creation of assets that will generate real wealth in the future. The primary criterion for the assessment of financial services institutions is the equitable distribution of the ownership of assets. (Kelso, Gates, Turnbull, Reich)

There is an economics of the commons (public goods and services, sustainable ecology, quality of life) that is different from and complementary to the economics of markets (which produce trade goods and services). (Barnes, Bollier, Brown, Cahn, Daly & Cobb, Galbraith, George, Henderson, Hawken, Kuttner, Lessing, A. & L.H. Lovins, Osborne & Gaebler, Rowe.)

In the economics of the market system, human labor (including intellectual as well as manual labor) is a cost. In the economics of the commons, human creativity and relationships are intrinsic forms of wealth. Shifting from a view of human resources as costs to a view of human labor, creativity and relationships as assets (intrinsic forms of wealth) leads to new approaches to accounting for value and is key to the creation of an abundant, information-rich service economy.

Additional information is available on the Skaggs Island Foundation “Sustainable Community Economics” Web Site at <http://www.skaggs-island.org/sustainable>.