

An Impact Assessment Model for Web-Based Time Banks – A Thought-Experiment in the Operationalization of Social Capital

Liz Moyer

School of International and Public Affairs
Columbia University, New York, NY

lizkmoyer@gmail.com

Abstract

The following paper is meant to be practical, in that it offers an impact assessment model for web-based time banks that was produced as a consultancy project deliverable; and academic, in that it offers a thought-experiment about the measurement of social capital and its association with sustainable development. As the development field continues to transition towards sustainable models that include social variables, innovative impact assessment tools are needed to fully understand the role of these variables for planning and investment. Web-based time banks – online networks that members exchange services by using an alternative currency in the form of time – offer an opportunity to look at the operationalization of social variables in a unique way, particularly social capital and its relationship to economic development. The impact assessment model seeks to answer: how do time banks as a development intervention augment the social capital of communities? The model was designed based on three dimensions of social capital, psychological, social and economic, and Edgar Cahn's theory of co-production. The model contributes to the economic valuation of time bank participation through the metrics: Market Value Savings and Economic Risk of Participation.

Author's Note

In alignment with the nature of time banks, I have been blessed with the generosity of mentors, colleagues, strangers, and friends in collaboration on this research project. First and foremost, I thank my faculty advisor Dr. Andre Correa d'Almeida, who guided me in both my Development Practice summer field placement, and in the SIPA independent study that were used to develop the research. His expertise was crucial in the construction of the model and the paper's arguments. I am grateful to Tomás González Olavarría and the Minkay team, with whom I had the pleasure of working in-person and remotely. I would like to thank Gabriele Donati and TIMEREPUBLIK for their openness to being interviewed and sharing data and information. Thank you to Kathy Perlow from Lehigh Valley Health Network (LVHN)/Office of Health Systems Research and Innovation's (OHSRI) Community Exchange TimeBank, and Lois Arkin from the Los Angeles Ecovillage's Arroyo Seco Network of TimeBanks. Thank you to Rebekah Clark, Maria Lagorous, and Dr. Eva Weissman in the development of the economic value models. And last, but certainly not least, thank you to all of the friends and family who worked with me on this, through brainstorming sessions and general inspiration.

I was introduced to time banks three years ago while working with a housing and education project for homeless youth in the Dagoretti Market of Nairobi, Kenya called Harambee Youth Kenya (sponsored by the nonprofit organization Harambee USA Inc.). I designed an extension of the project called the Harambee

Aquaponics Project, which incorporated a time bank model into a social entrepreneurship that sold and installed aquaponics systems. Since then, I have been fascinated by complementary currencies, taking advantage of research opportunities to expand my knowledge base. Time banks hold particular interest to me because the model goes beyond offering an alternative system of currency, and provides a new framework for community interaction. What happens when community members interact with each other based on principles of equality and inclusion? And, of equal importance for development practitioners, how do we measure this impact for evaluation purposes?

Lastly, I would be amiss if I did not mention my larger career vision of being a bridge between alternative approaches to development practice and the emerging field of sustainable development. I believe it is incredibly important for my generation of practitioners to listen to our hearts and be creative in finding ways to translate what we hear into the institutional language the development field can digest. This is what a time bank impact assessment framework symbolizes for me.

Keywords: Social capital, time bank, sustainable development, monitoring and evaluation, project management, case study

1. Introduction

1.1 Time Banks

Time banks – community development programs entailing members exchanging services through an alternative currency in the form of time – have been growing in popularity over the past few decades, with a myriad of articles citing their positive impact on communities’ social capital stock (Válek and Jašíková, 2013; Reed, 2008). Beginning in the 1980’s, Edgar Cahn developed the time bank model in response to decreased social program funding, with the intention of turning welfare recipients into “co-producers” of the services they receive. This type of a participatory program is directly in line with shifts occurring in the development field, as the discipline transitions towards sustainable frameworks and practices that empower communities as active stakeholders instead of passive beneficiaries.

The time bank model was built on a four-pillared philosophy, coining the theory of co-production: every person is an asset, work has value beyond monetary terms, reciprocity is beneficial, and social networks build community (Cahn, 2004). Because of this, the alternative currency has been associated with strengthening local networks of mutual support through an egalitarian system of reciprocity (Seyfang, 2004). Programs have been primarily implemented on a small-scale throughout the United States and Europe, and are typically housed within larger organizations, such as hospitals, universities, and ecovillages (Cahn, 2004).

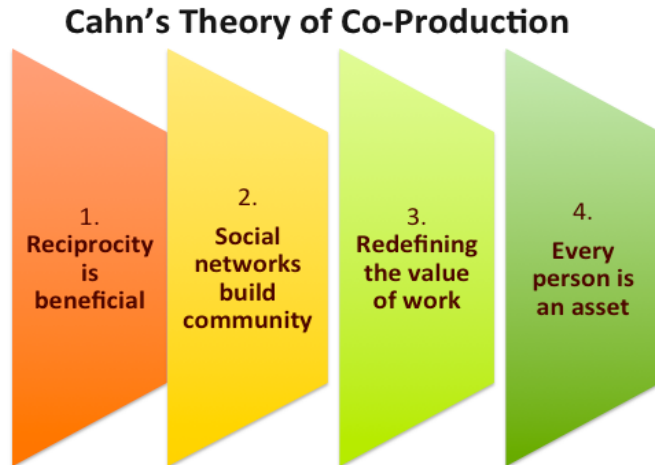


Figure 1: Principles of Time Banking by Founder Edgar Cahn (2004)

In action, time bank members earn credit for volunteering their time helping someone, and are then able to spend that credit on other services offered within the network. For instance, let us take the example of Sophia, a Mexican immigrant who moves to the United States and needs to improve her English to integrate into her new environment. Sophia joins her local time bank by signing up through their website, which is used to connect members, facilitate transactions, and monitor activities. When Sophia joins, she builds a profile that displays her name, location, offered talents, and needed services to other time bank members. Because she built her profile, showing a keen interest in participating, she receives an initial credit. Through the online platform she scans member profiles, reading reviews and contacting members to learn more about them. She finds Darnel, a bilingual English tutor with strong Spanish skills who she feels good about. She and Darnel message each other to negotiate a time, date, and curriculum for the tutoring session, in this case a two-hour session on verb tenses. Once they complete the two-hour session, Darnel receives time bank credit worth two hours of someone else's time in the network, and Sophia's time bank account is reduced by two hour credits. The transaction is complete once both Sophia and Darnel review each other's experience to help promote each other on the website and inform other members.

1.2 Social Capital in Sustainable Development

As the development field transitions towards a more sustainable paradigm of growth, institutions require contemporary tools to measure and understand newly incorporated social and environmental variables. Sustainable development, as an approach, aims to grow a country's gross national product (GNP) while simultaneously improving sociopolitical and environmental conditions, without compromising resources for future generations (WCED, 1987). The World Bank (1997) defines it as "a process of managing a portfolio of assets to preserve and enhance the opportunities people face."

The need to introduce social inclusion and environmental conservation into national planning is in part a response to the neoliberal economic paradigm that took precedence over the past thirty-five years (Harvey, 2005). Since the late 1970's,

neoliberal economic policies have institutionalized the belief that physical and financial capital are the driving forces of economic development. From this, development interventions, programs, and tools have been built to reflect the ideology by instilling top-down policies that emphasize physical and financial infrastructure. By the late 1990's, practitioners began noting the limitations of this approach, calling for models that incorporate social capital, human capital, and natural capital into national accounting, which resulted in the inception of sustainable development (Soubbotina, 2004; Piazza-Georgi, 2000).

Out of these newly incorporated variables, social capital has proven the most challenging to plan for because of its range of definitions and relative ambiguity that make operationalization difficult (WBO, 1997). Social capital is defined as the features of a social system that serve as a resource for individuals and the collective (Putnam, 2001; Woolcock and Narayan, 2000). Of particular relevance to sustainable development is the perspective that a community's social capital is a public resource that can be augmented through state and market operations, affecting the community's economic development (Pronyk et al., 2008; Soubbotina, 2004). Although there is consensus on this, the development field lacks a standardized definition about which observational aspects of things like networks, interactions, and institutions characterize beneficial social capital construction. Over the past 30 years, measurement methodologies have incrementally progressed, evidenced by the WBO Social Capital Initiative (1997) that sought to advance the operationalization of the concept, coupled by its publication of "Expanding the Measure of Wealth" (1997), which reviewed attempts to promote social capital within economic growth.

Because the measurement of social capital has not been standardized, development projects aimed at augmenting a community's social capital stock are pursued less and viewed as politically risky. These projects require strong monitoring and evaluation (M&E) systems to understand the impact of the intervention, to inform donors, and to guide planning and budgeting. Web-based time banks that use online platforms offer the sustainable development field a thought-experiment on how to advance the monitoring of social capital. The following paper outlines an impact assessment model that was designed for Minkay—a start-up, web-based time bank in Bogota, Colombia. The model was shaped by qualitative interviews with a sample of time bank administrators in the United States, as well as participatory field research in three low-income neighborhoods in Bogota as part of a larger consultancy contract with Minkay. Cahn's theory of co-production was used to design the metrics, coupled with a function of social capital that is outlined in the literature review.

2. Literature Review: Social Capital and Time Banks

Generally speaking, social capital is the collective properties of a social system that serve as a resource for psychosocial support, collective action, and social and economic development (Putnam, 2001; Woolcock and Narayan, 2000). What this resource looks like varies highly across communities, with each manifestation having different qualities marked by unique benefits and consequences. In this way, social capital, as a general concept, is not inherently positive or negative, but rather a natural feature of a community that can be changed (Woolcock and Narayan, 2000).

It is with this in mind, that social capital research aims to identify what characteristics of a social system produce different types of social capital, and which types of social capital should be cultivated for sustainable development.



Figure 2: Social Capital

A time bank is an example of a program that is associated with positively developing the social capital of a community (Knapp, 2012; Seyfang, 2004). However, interviews with a sample of time bank administrators in the United States show a deficit in time bank M&E systems, with programs either not monitoring impact or conducting small-scale internal surveys. In line with this, few research institutions have conducted scientifically rigorous studies on the social and economic impacts of the time bank model. The majority of quantitative research has been based on membership satisfaction surveys that pose methodological concerns because of small sets of primary data and limitations from self-reporting (LRCP, 2014; Collom, 2012).

A recent trend in the last decade shows hope for the research deficit as time banks begin using online platforms to connect members. Now time banks are able to reach larger population sizes and more easily collect social network and demographic data through time bank software packages. Whether the time bank is a small-town program of 200 members part of the Time Bank USA network, or a large-scale operation like TIMEREPUBLIK's ever-growing 20,000 member international community, every time bank uses a software package to log information about their members and the services exchanged.

With this in mind, the following section outlines literature on social capital measurement methodologies, as well as relevant research on the impact of time banks. This outline was used to build the paper's impact assessment model, which evaluates if and how time banks influence a community's social capital stock. The literature is organized into three scopes of analysis: *Community Psychology*, representing the micro, psychosocial level; *Social Networks*, representing the meso, social level; and *Economic Development*, representing the macro, economic level.

2.1 Community Psychology

Although social capital is considered a collective resource that is not embodied by one individual, a community's social capital stock is analyzed by looking at the aggregate of individual attitudes (WBO, 1997). Therefore, to understand the impact of time banks, it is necessary to collect data about psychosocial indicators of social capital, such as feelings of trust and belonging, and norms of reciprocity. This can be used to assess the claim that time banks improve levels of social cohesion within communities (Knapp et al., 2010).

Time banks are associated with strengthening levels of trust among members, which is the most frequently cited indicator of social capital (Knapp et al., 2012; Lochner et al., 1999). Feelings of physical safety are used as a metric for trust, as well as opinions about general feelings such as, "people in this neighborhood can be trusted" (Lochner et al., 1999). The World Value Survey (WVS) is a world-renowned data collection instrument that measures people's attitudes and beliefs. For the past 35 years, the WVS has gathered data from approximately 100 countries to compare how belief trends influence political and social development. Additionally, a network's community competency, often associated with social capital, is based on members' beliefs that the community can provide for itself in times of need (Lochner et al., 1999). This concept directly aligns with Cahn's theory of co-production, in which people receive tools to actively participate in generating their own welfare.

Another feature associated with time banks is that they create a sense of community among members, which is a common psychosocial indicator of social capital (Wallis and Killerby, 2004). According to a report by the Hawaii Executive Office of Aging (2014), 85% of its time bank members report an increased sense of community belonging since joining the program. This indicator reflects individual identity with the collective, in terms of objective perception of the unit and the community's supply of emotional support. This is useful for analyzing the public good characteristic of a community's social capital stock. Questions about shared sense of history and values, as well as feelings of comfort and significance within the community, are common metrics (Lochner et al., 1999).

In a similar vein, time banks are said to promote norms of reciprocity, a hallmark indicator of social capital, because members are allowed and encouraged to ask each other for help (Válek and Jašíková, 2013; Zischka, 2013). Research shows that the majority of time bank members join the program because it allows them to participate in society in a way that aligns with their values, such as contributing to community and helping those in need (Collom, 2007). Within the social capital field, norms of reciprocity are traditionally measured through metrics about favor lending and goods exchanged among community members, as well as frequency of volunteer work, seen in the approach by the Households and Subjects module of the Italian Multipurpose Survey on Households (Schrivens and Smith, 2013).

2.2 Social Networks

At a basic level, an online time bank is a network through which people exchange services. This holds strong implications for social capital research because social networks are its primary unit of analysis. These analyses take a quantitative and qualitative research approach through examining information about the services and resources accessible within a network, as well as the collective characteristics of a network, such as participation levels and community competency (Schrivens and Smith, 2013).

Online time bank software provides an opportunity to analyze social networks through data collected from the web platform. According to Collom (2012), time bank transaction records are a rare form of social network data because metrics can be followed over a longitudinal period, network connections are asymmetrical, and exchanges are quantified according to time. Although time banks use a variety of software packages, every package has similar features in terms of monitoring membership transactions, such as accounting for the type of service exchanged, number of hours exchanged, date of exchange, and members involved in the exchange (Collom, 2012). Collom was the first to explore this connection, identifying seven derivable indicators, such as number of active members, frequency of hours exchanged, and ego network density. For instance, in regard to social capital augmentation, he proposed that the average number of reciprocated contacts between members provide indication for the type of social capital being cultivated. If software data shows a high degree of two-way exchanges, it can be surmised that the time bank is generating bonding ties among its members (Collom, 2012).

Traditionally, social capital research measures network characteristics by collecting quantitative data about the density and size of groups (Woolcock and Narayan, 2000). This is done through group participation measures that use survey responses to aggregate the number of different organizations in which the average community member participates (Glaeser et al., 2002). It is most easily done through formal membership surveys, such as census data or association records, but is also conducted at the informal level to examine local and neighborhood connections. Again, this suggests strong potential for analyzing social capital change through time bank software packages because this information is readily available.

In terms of analyzing the qualitative characteristics of a network, authors have created network typologies to better understand the wide range of social capital manifestations that exist, as well as their associated development outcomes (Woolcock and Narayan, 2000). For instance, network systems have been categorized as either having a formal structure or an informal structure, which influences the type of ties that comprise the network (Putnam, 2001). Formal networks are products of an institution or market, and define rules of behavior through policies, laws, or contracts. Informal networks are born from community-based family ties and have implicit standards of conduct reinforced by positive and negative social reinforcement (WBO, 1997). Formal network structures tend to be made up of bridging ties that are characteristic of an intercommunity network (Piazzzi-Georgi, 2001). Bridging ties are thin connections common among large, heterogeneous groups that benefit from the fluid transmission of information and opportunities (Woolcock and Narayan, 2000). This is commonly seen in developed

countries, in which sparse connections between people, companies, and institutions are the glue that facilitate economic activity, technology advancements, and knowledge sharing (Cattell, 2001).

On the other hand, intracommunity networks are more indicative of informal structures that are made up of bonding ties. This type of social capital is prevalent among homogenous groups of people with tight-knit connections born from family, ethnicity, or geographic location (Piazzzi-Georgi, 2001). Bonding ties create close networks of people who share similar life experiences and use trust and personal knowledge as currency to facilitate transactions and activity (Woolcock and Narayan, 2000). Low-income communities have been cited as having high stocks of bonding social capital – due to reliance on informal networks for support and opportunities – and limited bridging capital, explaining the deficit in resources, like new ideas and job opportunities, that are outside of the community's immediate scope (Piazzzi-Georgi, 2001).

2.3 Economic Development

Although limited in sources, time banks have been cited as having a positive impact on a community's access to resources and levels of trust among members, which hold implications for local economic development (Seyfang and Longhurst, 2012). In general the economic valuation of social capital is difficult because it is a resource acquired by a group of people; it cannot be reduced to a single unit of account, nor can a person be described as having or not having social capital (Rose, 1999). In a similar way, valuing the economic impact of time banks is challenging because of the host of intangible impacts and ripple effects related to the program.

To date, the New Economics Foundation and the London School of Economics and Political Science (LSE) are the two primary institutions that have conducted economic research on time banks. Knapp's (2013) team used decision modeling to understand the economic costs and benefits to time bank participation. They found an annual cost per member of between £312 and £902 with an estimated return of over £1,300, plus a reduction of £187 per member in benefit claims. Echoing Knapp's findings, the New Economics Foundation conducted several Social Return on Investment analyses that found a conservative estimate of a £3.40 social return per £1 invested (LRCP, 2014). The external validity of these findings is questionable, as the economic returns of a time bank rely heavily on the services offered and the socioeconomic standing of participants.

The economic value created by time banks is especially relevant because a large proportion of people who join time banks are categorized as socioeconomically impoverished (Seyfang, 2004). In a review of twelve time banks, Seyfang (2004) found that 67% of programs targeted low-income communities, with 72% of members unemployed, 54% receiving government-sponsored support, and 58% living in a household with an annual income of less than £10,000. This is supported by an evaluation survey from the Visiting Nurse Service of New York Community Connections Timebank, which found that 73% of members said participation helped them save money, with the greatest impact felt by members with an annual income of less than \$9,800 (LRCP, 2014).

In addition to this, time banks have been associated with increasing the likelihood of formal employment and/or volunteer work from program participation. Although a small probability, Knapp (2012) found a 4.5% increase in likelihood of returning to employment due to participating a time bank. This is supported by Seyfang's (2004) finding that 51% of surveyed time bank members would not have participated in volunteering outside of the time bank if it was not for the program. This is relevant to the Corporation for National and Community Service's report that the rate of community service within the United States continues to rise, with 64.5 million Americans having volunteered 7.9 billion hours in 2012, implying a need for systems like the time bank model to account for this work. The time bank model helps organize and incentivize volunteer work, which has been found to reduce social welfare issues, according to data from the British Household Panel Survey (Zischka, 2013).

All of this influences the type of social capital a community is endowed with, which has implications for the area's economic output. Levels of trust among community members, which is associated with social capital, influence an area's economic activity in terms of how business is conducted, information is shared, and opportunities are generated. Woolcock and Narayan (2000) purport that social norms facilitate economic activity by influencing transaction and information costs, trade negotiations, the collective management of resources, and civic participation. They conclude that strong networks of formal and informal support increase the capacity of communities to address issues of poverty and vulnerability. These social norms include how reputations are formed and what type of reputations are valued, directly related to levels of trust among individuals. Authors continuously explore the relationship between reputation, trust and economic output, applying theoretical explanations to its association with development (Dasgupta, 2005) or empirical models to concepts like altruism (Mui et al., 2013).

A large-scale WBO study that looked at the impact of social capital on household income in rural Tanzania reflects Woolcock and Narayan's point. The analysis was based on 1995 Social Capital and Poverty Survey data, which provided information about the associational activity of 5,000 rural households and household members' levels of trust in institutions and community members. It concluded that there was a significant positive correlation between a village's social capital level and average income level. A one standard deviation increase in social capital was associated with an increased household expenditure of 20% to 30% for each person. This associated impact was attributed to improved public services, greater access to credit, use of improved agriculture inputs, and increased community activity. It was noted as being comparable to an increase in non-farming assets or the tripling of a person's education level (Piazzi-Georgi, 2000).

3. Methodology

Based on Edgar Cahn's theory of co-production and the literature review on social capital operationalization, an impact assessment model was designed to answer the question:

"How do web-based time banks augment the social capital of the program's community?"

The impact assessment model was a deliverable for a six-month consultancy project for Minkay, a start-up, web-based time bank in Bogota, Colombia. The design of the model was based on participatory field research, qualitative interviews, and secondary research. The participatory field research was conducted in three low-income neighborhoods in Bogota, Colombia (Rincon de Lago, La Colina, and Laureles), in which groups of participants were asked to respond to words associated with time banking (“trust,” “exchange,” “community support”) and describe how these ideas are reflected in their neighborhood. This was supplemented by quantitative data collected from a survey of approximately 100 people. The quantitative survey used questions from the World Value Survey (WVS) to measure attitudes about norms of reciprocity, safety, and trust, as well as collect demographic information related to socioeconomic status.

Further, a sample of time bank administrators from the United States was interviewed about the type of M&E techniques their programs use, specifically in regard to how they assess the progress of their program. The sampled time banks varied in institutional context, ranging from a geriatrics program at a Pennsylvanian hospital, to the extension of an ecovillage in California, to a for-profit web venture connected with the sharing economy. Interview data was fortified by a literature review of social capital operationalization and time bank impact evaluation, which was used in a Logical Framework (LogFrame) Analysis. The LogFrame approach is relevant for time bank project management because it is designed around a theory of change that is then defined using measurable indicators, outputs, and metrics. The following time bank impact assessment model is designed around the theory of change that: “If a time bank program is implemented in a community, then the social capital of that community will change.”

4. Impact Assessment Model

The impact assessment model offers a basic framework for measuring social capital as a function of psychological, social, and economic variables that are impacted by a web-based time bank program. It includes data collection instruments, a theoretical framework, and indicators with formulas of analysis. The model is contingent on the assumption that the time bank operates through a web-based platform, and that the population sample consists of active members within the specific program. Time bank programs are encouraged to use this model as a foundation for their M&E system and to adapt it to meet the specific contextual needs of its program. For example, a time bank that is housed by a hospital can incorporate metrics about quality of health into the model to evaluate health care impacts correlated with time bank participation. Additionally, the model can be used to monitor the effect of time bank participation on individual members’ attitudes, as well as the local economy of the time bank’s network.

The model is part of a comprehensive M&E plan, in which a full-time staff gathers and synthesizes data, as well as reports the findings for funding and program development. In the competitive arena of government and donor funding, evidence-based reporting is needed to attract financial investment and to demonstrate returns on an investment. An impact assessment model quantifies the social and economic effects of the time bank, which provides easily digestible information for donors and

government agencies. In addition to this, information from an impact assessment model can be translated into program milestones, which are relevant to investors as well as participants. A M&E system can also inform the internal management of the time bank, specifically in regards to planning and budget development.

4.1 Data Collection Instruments

The impact assessment model provides a means of evaluating incremental progress, as well as annual and long-term impact through qualitative and quantitative metrics. The three data collection instruments are an entry-level (baseline) survey questionnaire, an annual survey questionnaire, and the time bank website's software package. Data from surveys and the website should be collected on a quarterly basis. This recommendation is derived from literature, which found three-month periods to be the most accurate reflection of time bank program activity. This time period accounts for fluctuations due to differential participation, a common trend in voluntary organizational activity (Collom, 2012).

The survey collects data about the affection and attitudes of participants as psychological metrics of social capital. Survey questions measure members' personal experiences participating in the time bank and how this experience is reflected in concepts such as social cohesion, sense of belonging, trust, and community competency. The questions align with the framework of indicators, which was designed based on the social capital and time bank literature review.

A time bank's web-based platform offers the program an easy-to-use data collection tool that provides the M&E system with a host of metrics. Because transactions are coordinated and negotiated through a website, evaluation data is easily generated through the software package. Collected data will be used to assess the social capital indicators associated with network size, participation rate, and trust, as well as the economic value created within the time bank community. Metrics of social capital augmentation align with the same set of indicators used to analyze survey data.

4.2 Framework

Indicators and metrics of analysis were developed based on the three social capital themes outlined in the literature review: Community Psychology, Social Networks, and Economic Development. Edgar Cahn’s theory of co-production was organized within these categories to draw parallels between the social capital literature and the time bank model. See Appendix A for a full table of metrics.

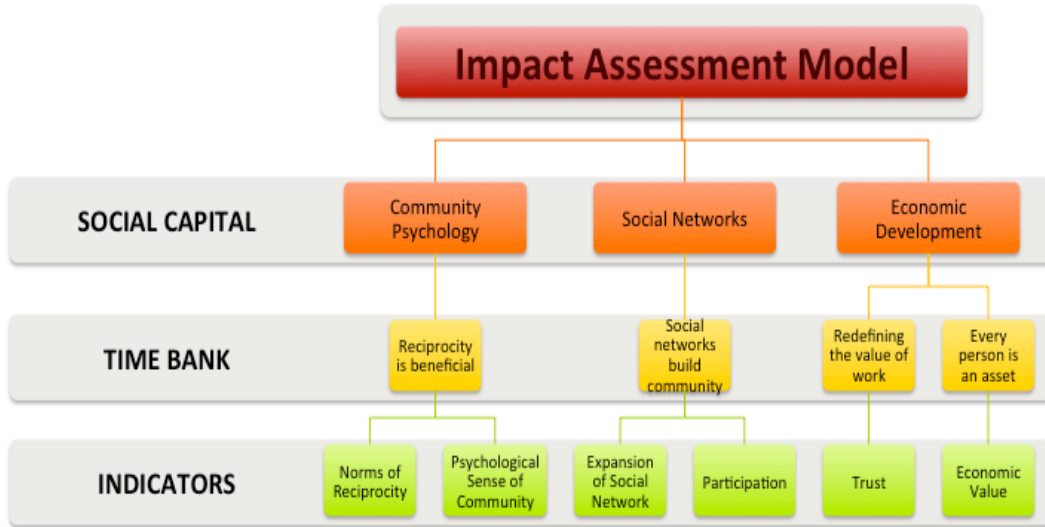


Figure 3 – Time Bank Impact Assessment Model Framework

4.3 Indicators: Community Psychology & Reciprocity

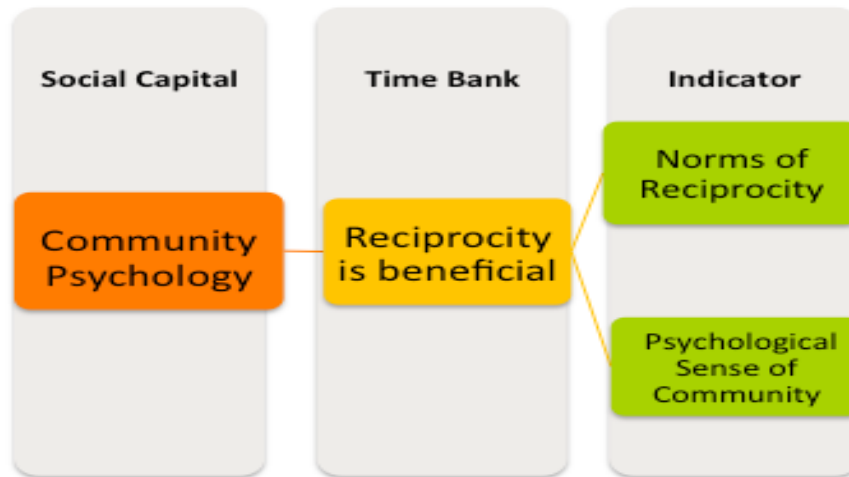


Figure 4 – Community Psychology and Reciprocity Indicators

The indicators *Psychological Sense of Community* and *Norms of Reciprocity* were developed from the social capital literature on Community Psychology, as well as Cahn’s theory that reciprocity is helpful.

4.3.1 Psychological Sense of Community

Does the time bank program create a psychological sense of community among its members? Do members identify as being part of a collective unit that they share an emotional and social connection with? If so, are there implications that the academic and development community can draw from about egalitarian systems of governance and trade? In general, survey questions for this indicator measure individual member’s perception of how they view themselves as part of the community, how they feel the community views them, and other such metrics of social cohesion.

4.3.2 Norms of Reciprocity

Does the time bank create norms of reciprocity among its members through the way it structures and facilitates interactions? Survey questions capture data about members’ views on the motivations of fellow community members’ actions. As an institution built on Cahn’s theory that reciprocity is beneficial, does participating in an egalitarian system of exchange influence cultural norms beyond the scope of the network? A control group is needed in further research to accurately measure how the presence of a time bank influences the greater community at large.

4.4 Indicators: Social Networks & Building Community

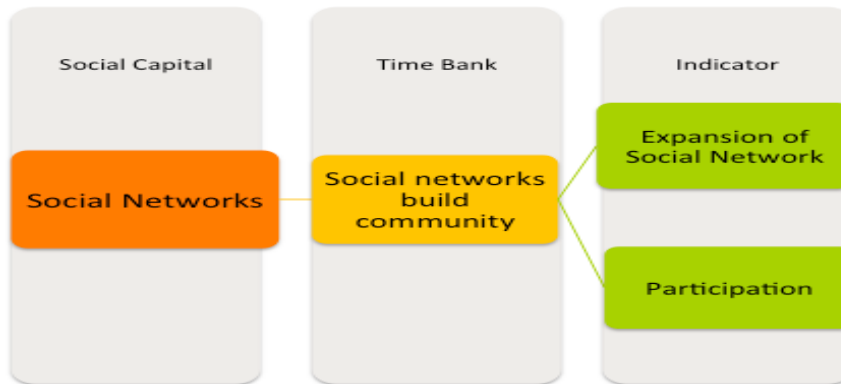


Figure 5 – Expansion of Social Network and Participation Indicators

The indicators *Expansion of Social Network* and *Participation* were developed from the social capital literature on social networks, as well as Cahn’s theory that social networks build community.

4.4.1 Expansion of Social Network

Does the time bank program expand members’ social networks? The indicator primarily examines social networks through quantitative metrics with the assumption that larger time bank networks provide members with greater access to service opportunities. It is necessary to verify this assumption through data analysis about the number and types of services offered within specific time bank networks.

Through this indicator, the time bank network as a whole is analyzed, as well as members’ personal networks of “followers” that are built based on interests, services offered, or geographic location.

4.4.2 Participation

How does participation in a time bank affect members’ community competency and perspective on their ability to influence community? Does the time bank model accomplish Cahn’s vision of individuals being co-producers of their own welfare? If community competency is increased, how does it translate into members’ perceptions of their ability and the community’s ability to be agents of change? The indicator uses survey questions to measure levels of community competency, and website analytics to capture the number and frequency of member exchanges. It is necessary to control for time within this indicator category because of differential participation.

4.5 Indicators: Economic Development & Redefinition of Work and Assets

The indicators *Trust* and *Economic Value Creation* were developed from the social capital literature on Economic Development, as well as Cahn’s theories that work has value beyond the market price and that every person is an asset.

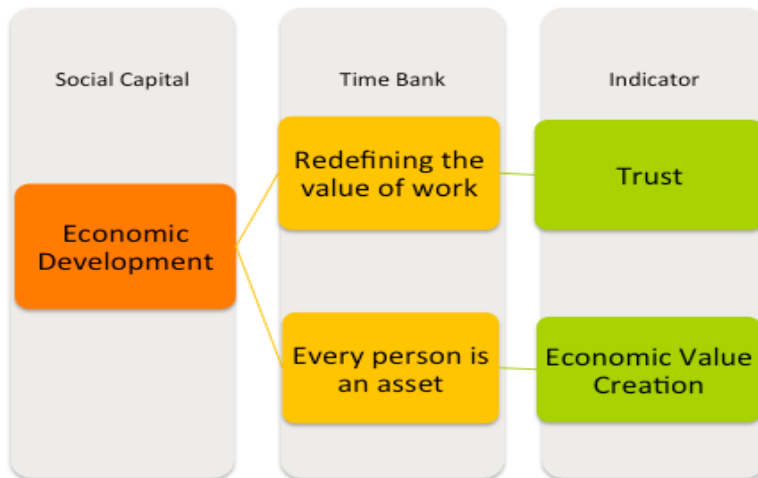


Figure 6 – Economic Development and Redefinition of Work and Assets Indicators

4.5.1 Trust

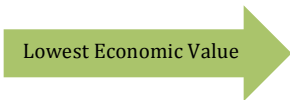
Does the time bank program increase levels of trust among its members? Part of many time bank platforms is reputation-rating systems that ask members to provide feedback on their experience with other members. How does this transparency and provision of information influence transaction decisions and local economic development? Are levels of trust higher among time bank members than among members of the general community?

4.5.2 Economic Value

Does the time bank program generate economic value for participants and the local community? For small programs it is possible to calculate this for every service exchanged within the time bank network. For programs that are larger in size, such as TIMEREPUBLIK’s growing population of 20,000 members, it is recommended to use information about the top twenty services exchanged on the platform, and their associated market value via wage rates to calculate the net financial impact.

The two primary metrics for this indicator are market value savings and the economic risk of participation. Market value savings is based on the assumption that accessing services through the time bank generates economic value in the form of disposable income. It is assumed that members receive services they would have otherwise purchased in the formal economy.

Economic risk of participation operationalizes the potential loss of economic return that a member takes on by performing a service within the time bank market, as opposed to the formal market. The calculation is based on the financial compensation that is foregone within the formal market because of participation in the time bank market. It is not a direct loss, however, which would be considered a transfer, because every hour of performed service is compensated by a credit that is worth access to another service; this credit has an economic value. Therefore, the economic risk of participation comes in the form of potentially exchanging the credit for a service that has a lower economic value than the service the member contributed.



Service (s)	Hourly Wage (w)	Hours Exchanged (H)	Individual Economic Risk	Total Economic Risk (r)
Writer and Author	\$15	27.5	\$4	\$110
Chef	\$11	14.55	\$0	\$0
Photographer	\$14	49.05	\$3	\$147
Translator	\$19	249.05	\$8	\$1,992

$$f(risk) = (w_{s_1} - w_{s_{min}}) \cdot H_{s_1} = r_{s_1}$$

Figure 7 – Example of Economic Risk of Participation Valuation

5. Further Research and Implications

The aforementioned impact assessment model was built based on progress in the field of social capital operationalization and research on time bank programs and their software technology. The model provides a tool to capture the surface-level socioeconomic impacts of time banks on local communities through the lens of social capital development. While the model provides a basis for time bank M&E, there are a number of opportunities to strengthen the model by quantifying non-monetized benefits, such as effects on human capital development, civic

participation, and municipal budgets. There are also opportunities to advance market research on low-income communities, all of which hold implications for sustainable development.

The time bank model has been associated with human capital development because members have the opportunity to exchange skills-learning services, and are able to practice skills within the parallel time bank market. These both contribute to increased readiness to participate in the formal market. Knapp (2013) found that there is a 4.5% likelihood of returning to or entering the job market because of time bank participation. This statistic requires further verification across time bank communities, as well as a comparative analysis of the number and types of skills-learning services that are being exchanged within programs.

Time banks have been cited as positively impacting the social cohesion of local communities (Seyfang and Longhurst, 2013), which affects local systems of governance because programs organize and reward civic participation. This is reflected in the way that time banks strengthen neighborhood networks, ultimately reducing social isolation and inclining people to see themselves as part of a community and to care about its wellbeing. Strengthened networks improve information sharing, which can be used to advertise community events, local forums, and association meetings. Enhanced communication channels provide a means to organize collective action to achieve political goals and hold government officials accountable.

The various impacts of social cohesion have the potential to generate long-term savings for national and state budgets, as communities become less reliant on the state due to strengthened community networks. Social cohesion has been associated with reduced crime and antisocial behavior, as well as increased public safety (Knapp et al., 2012). Similarly, time banks have been associated with having positive physical and mental health impacts, such as improved self-esteem and confidence, because of reduced social isolation (Knapp, 2013; Reed, 2008). All of these factors influence state welfare programs, and require advanced operationalization to monitor and monetize this influence.

Lastly, there is a significant opportunity to use time bank M&E systems to collect data about emerging markets in developing countries. As of now, there is limited information about consumption patterns in low-income communities throughout the world. Gathering data about access to resources opens up doors for several fields of interest, including cost-benefit analyses and other such analytical models of assessment.

6. Thought-Experiment for Sustainable Development

Without proper M&E systems, time banks cannot say with certainty the type of effect they have on social capital. Based on information from the literature review, though, the time bank model and social capital typology constructs allow for an interesting thought experiment on how a participatory model like time banking can impact a community's social capital, and what role time banks can play in the sustainable development arena.

Projects within the sustainable development field seek to improve the conditions of low-income communities by providing access to resources and

improving a community's capacity to utilize the resources. Rural and urban communities that are targeted by development projects often naturally rely on informal networks to operate and survive. A project that incorporates a time bank model into it can tap into the pre-existing social infrastructure of the village or urban neighborhood, and build upon it. This has the potential to increase the likelihood of community ownership over the project, which increases its success and sustainability.

An example of how a time bank could be incorporated into a development initiative is by using the model to compensate Community Health Workers (CHW). CHWs are local community members that deliver basic health care services to rural households as part of a country's larger health care system. CHWs serve the community that they live in and are often unpaid, which has been cited as a challenge to the sustainability of the approach (WHO, 2010). A time bank would provide the CHW model with a credit system that would reward and incentivize CHW work through access to other services or goods, depending on the model.

On a more theoretical level, Cahn's theory of co-production is in line with emerging trends in participatory development practice, in which beneficiaries are active participants in the project's design and implementation instead of passive beneficiaries. The time bank model invites community members to actively participate in the development of their community, in contrast to merely receiving resources from an external source. This has psychosocial implications for the way a community feels about development assistance, and how a community develops ownership over newly installed wells or hygiene programs. Ultimately, participatory methods of development speak to a shift in the power relationship between development agencies and communities, as communities are more accurately being seen as having equal stake.

Lastly, it can be said that a time bank is a system that formalizes informal networks of local community support, which implies that the program develops beneficial features of both bonding and bridging social capital ties. Time banks use trust (based on a reputation rating system) as the currency with which members exchange services. Using this type of community-specific trust as a mechanism for economic activity is a hallmark feature of bonding ties that are common within informal networks. On the other hand, online time banks offer a means for intercommunity relations in that they connect diverse groups of people with one another, which is typical for formal networks with bridging ties. In this way, time banks offer a model that taps into the positive aspects of both informal and formal network typologies, actualizing the potential of local community support through structure and organization.

7. Limitations

The model design was based on metrics and indicators used in sociological, community psychology; social network analysis; and development research studies that hold academic credibility, but it is the first of its kind to evaluate a time banking model specifically. This has to do with the traditionally small-scale, community-based nature of time banks, in which programs often lack certain formalities, such as M&E systems. This is a limitation to the model's design, as there was limited literature to compare the model to.

Along with this, the model is conservative in the extent to which it can generate accurate estimates of economic value creation, indicated by the “Further Research” section. Because time banks are built on Cahn’s theory of work having a value beyond market estimates, challenges arose when applying formal economic models of financial valuation to time bank activity. For instance, the economic risk of participation metric in the *Economic Value Creation* indicator provides a safe estimate of the opportunity cost of participating in a time bank. There are limitations to this because the assumptions used to develop the metric were moderate, such as the value of a time bank credit, which implies that the actual cost of participation is lower.

Bibliography

- Cattell. (2001). Poor people, poor places, and poor health: the mediating role of social networks and social capital. *Social Science and Medicine*, 52, 1501–1516.
- Cahn, Edgar S. 2004. *No More Throw-Away People: The Co-Production Imperative*. Washington, D.C.: Essential Books.
- Coleman, J. (1988). Social Capital in the Creation of Human Capital. *Chicago Journals*, 94, S95–S120.
- Collom, Ed. 2012. “Key Indicators of Time Bank Participation: Using Transaction Data for Evaluation.” *International Journal of Community Currency Research* 16: 18–29.
- Collom, Ed. 2007. “The Motivations, Engagement, Satisfaction, Outcomes, and Demographics of Time Bank Participants: Survey Findings from a U.S. System.” *International Journal of Community Currency Research* 11: 36–83.
- Corporation for National and Community Service. 2012. *Volunteering and Civic Life in America*. <http://www.nationalservice.gov/impact-our-nation/research-and-reports/volunteering-america>.
- Dasgupta, P. (2005). Economics of Social Capital. *The Economic Record*, 81(225), S2–S21. Glaeser, D., Laibson, D., & Sacerdote, B. (2002). An economic approach to social capital. *The Economic Journal*, 112, F437–F458.
- Harvey, D. (2005). *A brief history of neoliberalism*. Oxford University Press.
- Knapp, Martin, Annette Bauer, Margaret Perkins, and Tom Snell. 2012. “Building Community Capital in Social Care: Is There an Economic Case?” *Community Development Journal*, Online.
- Knapp, M., Bauer, A., Perkins, M., & Snell, T. (2010). Building community capacity: making an economic case. *Personal Social Services Research Unit*. Retrieved from <http://www.pssru.ac.uk/pdf/dp2772.pdf>
- Lochner, Kimberly, Ichiro Kawachi, and Bruce Kennedy. 1999. “Social Capital: A Guide to Its Measurement.” *Health & Place* 5: 259–70.
- Lifespan Respite Care Program. 2014. *Timebanking Feasibility Study: Final Report*. Hawaii Office on Aging.
- Mui, L., Mohtashemi, M., & Halberstadt, A. (2013). A computational model of trust and reputation.
















- Piazza-Georgi, B. Econometric Research Southern Africa, (2000). *The role of human and social capital: extending our understanding*. South Africa: University of the Witwatersrand.
- Pronyk, P., Harpham, T., Busza, J., Phetla, G., Morison, L., Hargreaves, J., ... Porter, J. (2008). Can social capital be intentionally generated? A randomized trial from rural South Africa. *Social Science and Medicine*, 67, 1559–1570.
- Putnam, R. (2001). Social capital: Measurement and consequences. *Isuma: Canadian Journal of Policy Research*, 2, 41–51.
- Reed, Z. (2008). Co-production, time banks and mental health. *A Life in the Day*, 12(1).
- Rose, R. (1999, October). What Does Social Capital Add to Individual Welfare? An Empirical Analysis of Russia. Social Development Department, The World Bank. Retrieved from <http://siteresources.worldbank.org/INTSOCIALCAPITAL/Resources/Social-Capital-Initiative-Working-Paper-Series/SCI-WPS-15.pdf>
- Sachs, Jeffrey D. (2013). High stakes at the UN on the Sustainable Development Goals. *The Lancet*. 1101-1102.
- Schrievens, K., & Smith, C. (2013). Four Interpretations of Social Capital: An agenda for measurement. *OECD Statistics Working Paper*, 6.
- Seyfang, G., & Longhurst, N. (2013). Growing green money? mapping community currencies for sustainable development. *Sustainable urbanisation: A resilient future*, 86, 65-77. Retrieved from <http://www.sciencedirect.com.ezproxy.cul.columbia.edu/science/article/pii/S0921800912004259>
- Seyfang, G. (2004). Working outside the box: Community currencies, time banks and social inclusion. *Journal of Social Policy*, 33, 49-71. Retrieved from <http://search.proquest.com.ezproxy.cul.columbia.edu/docview/222037425>
- Soubbotina, T. The International Bank for Reconstruction and Development, The World Bank. (2004). *Beyond economic growth: an introduction to sustainable development*. Retrieved from The World Bank website: http://www.worldbank.org/depweb/english/beyond/beyondco/beg_all.pdf
- Sustainable Development Solutions Network (SDSN) (2013) Solutions for Sustainable Agriculture and Food Systems. Technical Report for the Post-2015 Development Agenda. <http://unsdsn.org/report-solutions-for-sustainable-agriculture-and-food-systems-released/>
- The World Bank. (1997, June). Expanding the Measure of Wealth: Indicators of Environmentally Sustainable Development. Environment Department.










Retrieved from

<http://info.worldbank.org/etools/docs/library/110128/measure.pdf>

- Válek, L., & Jašíková, V. (2013). Time Bank and Sustainability: The Permaculture Approach. *Procedia - Social and Behavioral Sciences*, 92, 986–991. doi:10.1016/j.sbspro.2013.08.788
- Wallis, J., & Killerby, P. (2004). Social economics and social capital. *International Journal of Social Economics*, 31(3/4), 239.
- World Health Organization. (2010). *Global Experience of Community Health Workers for Delivery of Health Related Millennium Development Goals: A Systematic Review, Country Case Studies, and Recommendations for Integration into National Health Systems*.
- Woolcock, M., & Narayan, D. (2000). Social Capital: Implications for development theory, research and policy. *World Bank Research Observer*, 15(2), 225–249.
- World Commission on Environment and Development (1987). *Our Common Future*. Oxford: Oxford University Press. p. 27. ISBN 019282080X
- Zelenika, I., & Pearce, J. M. (2013). The Internet and other ICTs as tools and catalysts for sustainable development: innovation for 21st century. *Information Development*, 29(3), 217–232. doi:10.1177/0266666912465742.
- Zischka, L. (2013). VALUING SOCIAL CAPITAL BY THE RESOURCES PEOPLE ALLOCATE TO ONE ANOTHER: Valuing Social Capital. *Journal of International Development*, 25(5), 609–625. doi:10.100

Appendix A: Indicator Table with Metrics

Social Capital	Time Bank (TB)	Indicator	Metric	Instrument	Answer Format/Formula of Analysis
 Community Psychology	Reciprocity is beneficial	Psychological sense of community	<i>"I feel a strong sense of community within my neighborhood."/ "I feel a strong sense of community within TB."</i>	Survey 	5-point Likert Scale
			<i>"People in my neighborhood respect me."/ "People in TB respect me."</i>	Survey 	5-point Likert Scale
			<i>"I am an important part of my neighborhood community."/ "I am an important part of the TB community."</i>	Survey 	5-point Likert Scale
		Norms of reciprocity	<i>"Would you say that most of the time people try to be helpful or that they are mostly looking out for themselves?"/ "Would you say that most people in TB try to be helpful or that they are mostly looking out for themselves?"</i>	Survey 	Multiple Choice
			<i>"In the past month have you helped a stranger or someone you didn't know who needed help?"/ "Since joining TB, in the past month have you helped a stranger or someone you didn't know who needed help outside of the TB network?"</i>	Survey 	Multiple Choice
			<i>Account balance: Ratio of the total number of hours spent to the total number of hours earned within the network.</i>	Website analytics 	$f(\text{reciprocity}) = H_{\text{spent}}/H_{\text{earned}}$
 Social Networks	Social networks build community	Expansion of Social Network	<i>"In the past month, how many new people have you met?" / "What percentage of your TB contacts did you meet for the first time through TB?"</i>	Survey 	Multiple Choice
			<i>Annual growth rate of TB member population</i>	Website analytics 	$f(\text{growth rate}) = (P_{\text{present}} - P_{\text{past}})/P_{\text{past}}$
			<i>Total number of active members in the TB network</i>	Website analytics 	Software data
			<i>Average size of personal member networks</i>	Website analytics 	$f(\text{personal contacts}) = (\sum \text{samples' personal contacts})/(\text{sample size})$
			<i>Number of different types of services offered by TB members</i>	Website analytics 	Software data
		Participation	<i>"I can improve the conditions of my neighborhood." / "Through TB I can improve the conditions of my neighborhood."</i>	Survey 	5-point Likert Scale
			<i>"The community can solve its own problems."/ "Through TB I can solve problems that arise in my"</i>	Survey 	5-point Likert Scale

			<i>community.”</i>		
			<i>Total number of hours exchanged (earned and spent) between TB members</i>	Website analytics 	Software data
			<i>Average number of hours exchanged per member</i>	Website analytics 	$f(\text{frequency of exchanges}) = H_Total/P_Total$
			<i>Frequency of exchanges (earned and spent) between TB members</i>	Website analytics 	$f(\text{frequency of exchanges}) = (H_Total/P_Total) / (\text{Time Frame})$
 Economic Development	Every person is an asset & Redefining the value of work	Trust	<i>“I trust people in this neighborhood.”/ “I trust people who I interact with through TB.”</i>	Survey 	5-point Likert Scale
			<i>Percent of TB members that received an average reputation rating of 4 stars or more in all categories: “punctuality,” “communication,” and “quality.”</i>	Website analytics 	$f(\text{reputation}) = P_Reputation/P_Total$
		Economic Value	<i>Market Value of Service Exchange</i>	Website analytics 	Marginal: $f(\text{market value}) = H(s_{-1}) \times w(s_{-1}) = v(s_{-1})$
					Aggregate: $F(\text{market value}) = \Sigma[v(s_{-1}), v(s_{-2}) \dots v(s_{-20})]$
			<i>Economic Risk of Service Exchange</i>	Website analytics 	Marginal: $f(\text{risk}) = [w(s_{-1}) - w(s_{-min})] \times H(s_{-1}) = r(s_{-1})$
					Aggregate: $F(\text{risk}) = [r(s_{-1}), r(s_{-2}), \dots r(s_{-20})]$
		<i>Net Economic Benefit</i>	Website analytics 	$F(\text{net}) = F(\text{market value}) - F(\text{risk})$	