Chapter 5

Time Bank Members: Participation and its Determinants

10 Introduction

12 In the previous chapter we focused on the organizational level, analyzing overall participation in Time Banks nationally and in our cases. Now we move down to the individual participant level, engaging transaction data from HEP and CE as well as our surveys from M2M. How often are these exchange networks used by members? Do participants maintain balanced accounts? Do they tend to exchange with many different members or just a few? Do they exchange a variety of different services or just a couple? Do members tend to be located in dense or sparse trading networks?

20 After reporting on our key indicators of participation, we test for statistical associations in an effort to determine what causes various forms and levels of participation. Do demographic variables impact member’s participation? Does motive for joining affect the type or level of participation? Finally, we analyze the social networks that are created by Time Bank exchanges, focusing on the connections between members: Who exchanges with whom? To what extent do members trade with others who are different than themselves? The findings from our three long-standing Time Banks will give us valuable insights into what members actually do when they become Time Bankers.

31 Key Indicators of Time Bank Participation: HEP and CE

33 Total Hours

35 The first variable that we investigate here is HEP and CE members’ total hours of participation. This is the total amount of time that members have provided services and received services in these organizations. In other words, it is the sum of Time Dollars earned and Time Dollars spent for each member. Descriptive statistics are provided as Table A5.1 in the Methodological Appendix for interested readers. Given the large variation in participation time, we constructed a categorical variable to highlight different levels of engagement in these Time Banks. Figure 5.1 illustrates members’ total hours in five categories. At HEP, one-quarter of all members have been involved in only one hour’s worth of service exchanges. At CE, this is much less frequent, with only 4% of members having exchanged only
Figure 5.1 Members’ total hours of participation in categories

One hour. The modal category at both Time Banks (32% of HEP members and 44% of CE members) is 2 through 20 hours of participation. The remaining categories are remarkably similar at both Time Banks: 15% and 17% in the 20-50 range, 10% and 12% in the 50-100 range, and 18% and 23% in the 100 or more hours range. These computations are totals for all HEP and CE members across time and do not control for membership length. Some members had recently joined when we stopped our data collection (on June 30, 2010) whereas others have been members since their Time Banks launched. Thus, the total hours of participation variables suffers from a time bias. Those who have joined more recently are very likely to have fewer hours of exchanges than those who joined long ago. Therefore, we have also calculated the average hours of exchanges per quarter of participation. This calculation controls for membership length (see Methodological Appendix).

Average Hours

Figure 5.2 illustrates the distributions of the average hours per quarter variable for HEP and CE members. Nearly one-third (32%) of HEP members average one hour per quarter or less, compared to 17% of CE members. Nearly one in five (19%) of HEP members and more than one-quarter (27%) of CE members average 2 to 3 hours of participation time per quarter. As in the previous figure, the values are very similar for the remaining categories with about one in five (19% at HEP and 21% at CE) averaging between 10 and 40 hours of exchanges per quarter.

While HEP has tended to have a larger number of active members than CE (see Figures 4.1 and 4.2), HEP members spend less time participating than CE members. On average, CE members have 121.0 total hours and 11.5 average hours per quarter compared to HEP members’ 85.6 total hours and 7.7 quarterly hours (see Table A5.1). Figures 5.1 and 5.2 illustrate that Time Bank participation varies tremendously in these two cases. At HEP, one-quarter of the membership has only exchanged only one hour worth of services and nearly one-third average an hour or less per quarter. So, a substantial percentage of HEP members join and do not engage in hardly any transactions. There are a variety of potential reasons for this.
Figure 5.2 Members' average hours per quarter of participation in categories

Some are too busy to participate, some join just to support the principles of an alternative economy, some are not in need of services, some move out of the area shortly after joining, some die, and some are new members as mentioned above.

We explore such limitations to participation in the final chapter. On the higher end of participation, we see 18% of HEP members and 23% of CE members have 100 or more total transaction hours. The highest category in average hours per quarter is 41 or more; at HEP we find 3% and at CE 5% of the membership are these heavy users.

Account Balance

Next we consider the account balance variable. This is perhaps the central question surrounding Time Banking for some people. What percentage of members spend more than they earn? Do any take advantage of their Time Bank and go on a spending spree, accumulating massive Time Dollar debt? As we have discussed, debt is tolerated and in some cases encouraged in Time Banking. One of the advantages of Time Banking over other forms of local currencies is that participants can receive services without having any Time Dollars or even if they have a negative balance. Debt is often framed as an incentive for providing services and seen as a future obligation to the system. If members get into too much debt the Time Bank usually intervenes, and in rare cases, can close a member’s account. Account balance has not been investigated in previous Time Bank research, so little is known about it.

We created a categorical variable to study account balance. Figure 5.3 provides the distribution of members’ account balances (as of June 30, 2010) in nine categories for HEP and CE. We defined accounts as “balanced” if the member had somewhere between 2 debits and 2 credits. The balanced category is the modal one at HEP with 38% of members. The “3 - 20 Credits” category is the most common one at CE with 34% of members. Debt, particularly high levels of it (51 or more hours in deficit), is found for only 3% of members at HEP and CE. The “3 - 20 Hours Debts” category contains 11% of HEP members and 10% of CE
Figure 5.3  Percentage of members in Time Bank account balance categories

In both of our cases, the Time Bank’s account is by far the largest debtor. This is because members provide many services to their Time Bank (such as program assistance and clerical work), but the Time Bank itself offers few services for Time Dollars to members. So, the Time Bank’s account tends to be a “sink” with many debits coming in and few credits being earned. HEP’s account balance is $-26,889 and CE’s is $-10,088. Yet unlike the federal budget deficit, this debt is not problematic. Indeed, it helps to keep the service exchange network functioning. To the extent that Time Banks provide Time Dollars to members who assist their organization, it can help spur further activity as those members have more incentive to go and spend those credits. This begins to reveal one of the secrets of Time Banking. The currency itself, Time Dollars or credits, are somewhat meaningless. They are simply a mechanism to encourage people to help one another. By definition, the overall balance of Time Dollars at any Time Bank is zero. All of the credits and debits will balance each other out when you sum member balances with the Time Bank’s own account. This is part of the explanation for why there are many more members with positive balances than negative balances. At both Time Banks, organizational members (usually nonprofits or small businesses) are more likely to be in debt. At HEP, 26% of organizational members are in some
amount of debt compared to 17% of individual members. At CE the difference is
more pronounced: 49% of organizational members are in debt compared to 14% of
individual members. As in the Time Bank itself, organizational members are more
likely to receive member services than provide them. For example, a local theater
can company may use Time Bank members to do bulk mailing, work their box office,
and usher the events. However, they may only provide one service to members:
event tickets. It is usually the case that limits on the number of tickets sold for
Time Dollars must be established as nearly all companies have operating expenses
which require the revenue from tickets sold for cash. These types of imbalances
are not uncommon. Most Time Banks would tolerate this situation. After all, the
organization does offer a valuable new service to members (event tickets) and
those that provide services to the organization also reap rewards. Bulk mailing
meetings, event ushering, and box office staffing all provide opportunity for social
interaction and community building. There is much more to Time Banking than
just the exchange of services.

These account balance results are a strong counter to skeptics of Time Banking.
Movement practitioners often face questions from people expressing quite a bit of
concern over the potential “free rider” problem and people “ripping off” others in
the network. What we have found here is that debt in these systems is relatively
rare. We also suspect that few of those in debt have nefarious intentions. As noted
above, some organizational members are in debt because they do not have many
services or have limits to what they can offer. Also, some individual members offer
services that are not in high demand. Others have disabilities or other constraints
that limit their participation. Later on in the chapter we will test for a variety of
factors to determine who is most likely to be in debt and who is most likely to have
many credits.

Number of Contacts

Next we will consider the size of members’ exchange networks within their Time
Bank, their number of contacts. Some people exchange with a lot of different
members whereas others do so only with a few. The average HEP member has
traded with 8.5 members and the average CE member has traded with 7.4 members.
At the upper end, one member at HEP has exchanged with 195 different members
and one CE member has a network size of 188 (see Table A5.1). More than one-
third (36%) of HEP members have exchanged with only one other member while
slightly less than one-quarter (23%) of CE members have a network size of 1. One-fifth of HEP members and a bit more than one-quarter of CE members have
2 to 3 contacts in their Time Bank. Slightly more than one-fifth of the members of
each Time Bank have exchanged with 10 or more members.

Overall, more than two-thirds of all members of these Time Banks have
exchanged with six or fewer members. Time Banks are not the source for large
numbers of trading partners for most members. While these networks are not
producing large quantities of contacts for most, those that exist may be quality
ones. The bonds that are formed among members are likely to be deeper than those gained from the average transaction in the formal economy. Most Time Bank exchanges are highly personal, while most formal economy transactions are very impersonal (see North 2010). Think about the difference between the Time Banker who calls up another member for a ride to a doctor’s appointment versus making a call to a taxi service. The two Time Bank members share an organizational affiliation, are more likely to have similar values, and are likely to have a substantive social interaction during the ride.

Reciprocated Contacts

The next measure we consider is the number of reciprocated contacts, two-way exchange partners. Reciprocation is one indicator of “bonding” social capital. Bonding ties tend to be strong and exclusive, creating social solidarity (Putnam 2000, Halpern 2005). These tend to be deeper connections among people who are rather similar to one another. When a member provides a service to one from whom they have previously received a service, they make the relationship reciprocal. Reciprocation is potentially significant – it further develops a social relationship, it represents “success” as these two participants have chosen to transact again, and the relationship becomes more egalitarian as both parties will have provided and received in the relationship. Reciprocity in social networks has not been studied that often (see Brody et al. 1983 and Lee 1985 for examples on elderly populations).

It is important to keep in mind that reciprocity of exchange is not necessarily a goal within Time Banks. Indeed, the advantage of Time Banking over bartering is that a member is not restricted to a relationship in which both people have something that the other one wants. By providing to one person but receiving from another in the organization, one maintains a sense of more generalized reciprocity while greatly expanding the opportunities for exchange. Thus reciprocated contacts, as measured here, is only one indicator of the patterns of exchange that occur within Time Banks.

Our results indicate two-way exchanges are more common at CE (see means scores in Table A5.1). Two-thirds of HEP members have not had any reciprocated ties. At CE, the majority of members have had at least one and 29% have had two or more. There appear to be two possible explanations here. First, HEP has more members who barely participate in their Time Bank (see Figures 5.1 and 5.2 above). These are people who are largely members “in name only.” Those who have barely participated are not likely to have any reciprocated contacts and this would cause the lower reciprocation rate. The second possibility is that there is something unique about CE that fosters greater reciprocation. Perhaps members have deeper social ties with one another in this Time Bank. As we learned earlier, HEP has tended to be a larger Time Bank than CE throughout their histories. Since CE is smaller, its intimacy may contribute to reciprocal relationships.
1 Ego-Network Density

2 Our next variable concerning participation in Time Banking is a measure of social 3 network density. In contrast to network size (number of contacts), the density of 4 one’s exchange network measures the extent to which the members with whom 5 one trades are engaging in transactions with one another. Network size and ego- 6 network density are variables that are regularly used in many studies. Some of the 7 most well-known examples in Sociology employ General Social Survey data (see 8 Marsden 1987, Moore 1990, McPherson, Smith-Lovin, and Brashears 2006). 9

10 We computed ego-network density for each individual member’s 10 “neighborhood” (see Scott 2000). Density is expressed as a percentage. If a member’s 11 trading partners (known as “alters”) have never exchanged with one another, that 12 member’s ego-network density is zero. If all of one’s alters have transacted with 13 each other, density is 100%. For this computation we ignore the direction of the tie 14 between members (providing versus receiving) and look only to see if a tie exists. 15 Some participants are located in highly connected regions of the overall network 16 while others are in sparse areas (where one’s alters are not exchanging with one 17 another). Dense networks are generally good for producing bonding social capital. 18 Information is likely to flow faster through denser networks as well (see Barabasi 19 2003). In Time Banking, referrals are an important way of learning about services. 20 Time Bank members often talk about the network and their exchanges within it 21 during their transactions. Thus, those who are in well-connected regions of the 22 network may be likely to have greater resources (in the form of information about 23 other members and services) and therefore, may be more likely to be more active. 24 If one’s trading partners are well-connected and talk about some great services 25 they have received or some members who are really in need of particular things, 26 that information may spur greater activity.

28 Figure 5.4 provides two social network diagrams (“sociograms”) of one HEP 28 and one CE member’s ego-networks. In each diagram, the members or “nodes” are 29 shown as circles. Ego (the member we are focusing on) is represented by a white 30 circle while their alters (the contacts that ego has transacted with) are symbolized 31 with black circles. The lines (technically referred to as “ties” or “arcs” or “edges”) 32 indicate that at least one transaction has occurred between these two members. 33 The arrowheads on the lines point to the recipient of the service. Lines with 34 double arrowheads illustrate reciprocal relationships in which both members have 35 provided and received services. As we will see later, sociograms can be made more 36 detailed by adding values to the ties (the number of hours of services exchanged) 37 as well as characteristics of the nodes (gender, age, etc.). For the purposes of this 38 analysis, we chose to keep the sociograms relatively simple.

39 Figure 5.4 shows the social networks of two people, chosen because they come 40 closest in their own exchanges to the average network size (contacts) and ego- 41 network density in HEP and CE (see Table A5.1). At HEP, we feature a member 42 who has traded with 9 others. By definition, there is a tie between the member 43 and each person he or she has either provided a service to or received one from. 44
The computation of ego-network density only concerns the ties among the other 18 members in the participant's network. That is, to what extent are the members that one trades with exchanging with one another? There are a total of 9 ties among the member's 9 exchange partners here (remember that we are ignoring the direction of the tie in this calculation of density and are interested in only whether any tie, provide or receive, exists). If each of the other members ("alters") exchanged with all of the others, there would be 36 ties. With 9 nodes, 36 undirected ties are possible. Therefore, this average HEP member's ego-network density is 25%. One-quarter of the possible ties among their alters are present.

For CE, we see a member who has traded with 7 others. There are 6 ties out of 27 the 21 possible ties among alters, resulting in an ego-network density of 29% for this member. Notice that all of the ties among alters involve the node positioned at "9 o'clock" in the diagram. That member has traded with all of ego's alters. Overall, the average ego-network density at CE is slightly higher than that at HEP (29.5% vs. 25.6%; see Table A5.1). At HEP, 43% of members have ego-network densities of 0% in which none of their alters have traded with one another. There are fewer of these poorly connected members at CE (30%). High network density is not common as only 15% of members in both Time Banks have densities of 67% or higher.

Figures 5.5 and 5.6 provide four sample sociograms from HEP and CE to illustrate the variability in network size and density in these two Time Banks. The top of Figure 5.5 provides the ego-network for a HEP member with a moderately sized network (13 alters) with rather high density (59%). That is, 46 of the possible 78 ties among alters are present. Here, most of the members that this person

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1 The number of possible undirected ties is found by the following formula: (Number of alters) x (Number of alters - 1) with the result divided by 2.
exchanges with are connected and therefore know one another. Information about members and services are likely to travel quickly through these densely networked channels.

The bottom of Figure 5.5 illustrates the ego-network of a CE member with a large network (113 alters) with low density. Despite how busy the diagram looks, there are actually relatively few ties among the member’s alters. Only 329 of 6,328 possible ties exist, resulting in a low density of 5%. As evident, there are challenges to visualizing large networks. One option is to exclude ego (and therefore their ties to alters) so that the sociogram only portrays the ties among alters (this is also a better depiction of the density measurement).

This also provides a good opportunity to discuss the association between network size and density. These two variables tend not to be totally independent of one another. That is, large networks often have lower density than smaller networks. In our Time Banks, density varies tremendously in ego-networks containing 20 or fewer alters. As members accumulate more contacts, density becomes lower on average. In general, it is more difficult for people to maintain ties with the same proportion of alters as a network grows. There are constraints to the number of social relations that people can feasibly maintain (see Friedkin 1981, Scott 2000).
The left side of Figure 5.6 shows a HEP member with a small network with low density. This member has exchanged with five others. Notice that ego has provided services to four alters and received services from one (the node at “5 o’clock”). There is only one tie of ten possible among alters. The right side provides an ego-network of a CE member with a small network size (4) and perfect density of 100%. All four alters have ties with one another.

What have we learned from these density statistics and sociograms? Most members do not have highly-connected ego-networks in these Time Banks. This suggests that Time Bank coordinators should encourage their members to talk about their experience in the organization and refer members to one another. New members would be better integrated into their Time Banks if they exchange with members who are well-connected. Time Banks are organizations full of resources (their members who provide services) and information flows faster through denser networks, increasing access to these resources. Later in this chapter we will investigate the determinants of network density to see who is most likely to have denser Time Banking networks. Denser networks may be more likely to produce more transactions as members have the opportunity to learn more about other providers.

Diversity of Services Exchanged

The last measurement that we present in this section of the chapter concerns service types. In Chapter 4 we discussed the types of services exchanged in these Time Banks as a whole. Now we want to take it down to the individual level to determine the diversity of the types of services that members exchange. Do members tend to exchange a variety of different services or just a few? In the formal economy most people tend to consume a variety of goods and services. It will be interesting to determine the extent to which Time Bankers exchange a range of services as well. As reported in Chapter 4, we coded all of the transactions into thirteen categories.
of service types. The appropriate statistic to measure diversity here is the Index of
Qualitative Variation (IQV), with the value “0” indicating transactions within only
one service category and “1” indicating equal amounts of transactions across the
thirteen categories.²

The average IQV score for HEP members is .40; it is .48 for CE members (see
Table A5.1). On average, CE members have slightly greater diversity in the types
of services they exchange. More than one-third of HEP members (36%) have an
IQV of 0, trading within only one service type. At CE, this is true for about one-
quarter of the members (24%). Thirty percent of CE members have moderately
high diversity (.61 - .80) in the services they exchange compared to 21% of HEP
members. Both Time banks have similar levels of high service diversity (.81 or
greater) with 14% and 13% of HEP and CE members in the top category.

Overall, there is quite a bit of variability in the diversity of service types
exchanged in these Time Banks. It is likely that this variable will be correlated
with others we have covered earlier in this chapter. For example, those who
engage in few transactions will be more likely to have no or little diversity in
the types of services they exchange. We will explore the connections among the
various key indicators of participation variables below. Since HEP is more likely
to have members who barely participate, this may be part of the explanation for
why CE members have slightly greater diversity in the services they exchange
on average. However, it is not entirely clear to us why CE members would have
greater service diversity than HEP members. HEP is a larger network which would
suggest that a greater variety of services are available. CE members are more
active on average though. So, again, it could be that greater activity brings greater
diversity. Alternately, it could be that CE members are just more likely to seek out
a variety of services. We will explore this in more detail later in the chapter.

Associations among Participation Variables

As we discussed above, it is likely that our participation variables are not
independent of one another. In this section we explore the potential statistical
associations among our seven key indicators of participation measured at the
member-level: total hours, average hours, account balance, contacts, reciprocated
contacts, ego-network density, and diversity of services. The Methodological
Appendix provides details for these analyses and the correlation matrices are

² The standard deviation is a better-known measure of dispersion, but should only
be used for numerical variables (and our service type variable is a nominal, categori-
onal one). The IQV has a convenient metric in that the statistic ranges between 0 and 1. An
IQV of 0 indicates a perfectly homogeneous distribution. That is, members would
only be exchanging one of the thirteen service types. An IQV of 1 indicates a perfectly
heterogeneous distribution with maximum dispersion. Here, members would have equal
amounts of transactions within each of the thirteen service types.
1 presented as Table A5.2. The majority of the associations are very similar across
2 both Time Banks and several of the correlations are quite strong.
3 Those with more total hours exchanged are found to have a higher number
4 of contacts (a larger ego-network). Also, those with more contacts have more
5 reciprocated contacts on average. As we speculated earlier, total hours of
6 participation and diversity in services exchanged are positively associated in both
7 Time Banks (though the associations are only moderate in strength). The more you
8 participate, the more likely you are to exchange different types of services. There
9 are two other interesting findings surrounding service diversity. The more contacts
10 (the larger ego’s network), the greater the service diversity on average. The more
11 people you trade with, the more likely it is that you will be exchanging different
12 types of services. Also, the denser one’s network is, the more likely you are to
13 have greater service diversity. This could be the result of referrals as discussed
14 above. Those located in denser trading networks are more likely to get information
15 about other opportunities. We did not find, in contrast, any meaningful association
16 between ego-network density and total or average hours of participation at HEP or
17 CE. Those in denser trading networks are not more active in their Time Bank than
18 those in sparse networks.
19
20 Demographics and Participation: Predicting Variation in HEP and
21 CE Engagement
22
23 Now we can move on to test the extent to which members’ demographic
24 characteristics influence their participation. There are a few previous case
25 studies of individual LETS systems in the U.K. that consider the impact of 26
27 some demographic variables on self-reported trading frequency. Though this 27
28 research is based on small samples and only one participation outcome (members’ 28
29 estimation of their frequency of participation), they will be useful to review here.3
30 Unemployment has been found to have mixed effects. Williams (1996c) finds that 30
31 the unemployed provide slightly more services in one case study, but finds that 31
32 unemployed provide less than the employed in another (Williams 1996a). In the 32
33 latter study he also finds that low-income members are providing fewer services 33
34 than higher-income members of that LETS. Seyfang (2001a, 2001b) finds that 34
35 “unpaid domestic workers” and the “permanently sick” are the most active in the 35
36 LETS she studied while retired members were the least active. After we present 36
37 our own results we will revisit these.
38
39 We tested the impact of the eleven independent variables that we focused 39
40 on in Chapter 3 (gender, age, race, household type, education, employment, 39
41 40
42 3 The Williams (1996c) study is based on a 1994 survey of 46 members (38%
43 response rate), Williams (1996a) is based on a 1995 survey of 109 members (22% response
44 rate), and Seyfang’s (2001a, 2001b) studies are based on a 1996 survey of 64 members
45 (60% response rate).
unemployment, income, self-reported health, disability, and membership length) upon our seven measures of participation that we have described in this chapter. Figure 5.7 provides a visual summary of the statistically significant effects in these models for HEP (see Methodological Appendix for details on these multiple regression models).

Membership length is significant in all of the models. Those who have been members of HEP longer are more likely to have higher balances, greater total hours, greater average hours, more contacts, more reciprocated contacts, and greater diversity in the services they exchange. Also, length is negatively correlated with ego-network density: members with more experience have less dense exchange networks. All of these findings reflect the fact that engagement, and in particular, providing services, increases with membership length. The density results indicate that it is generally more difficult for people to maintain ties with the same proportion of alters as one’s network grows (those who have been members longer have more contacts). As discussed above, there are constraints to the number of social relations that people can feasibly maintain (see Friedkin 1981, Scott 2000).

Figure 5.7 Summary of models of demographic variables predicting participation at HEP
Figure 5.7 also shows that minority members and those with disabilities are more likely to have lower balances. Further analyses do confirm that people of color are more likely to be in debt and less likely to have credits in their accounts. It may be that the services offered by minority members are in less demand or that not enough participants in this system are requesting services from these members. Or, it could be that their need for receiving services is greater; there is no sure way to know from our data what accounts for these differences. Those with disabilities are likely to be in greater need of services from the Time Bank and may have limited services that they are able to provide, resulting in lower account balances. Age also has some interesting effects at HEP. Older members are more likely to have higher balances, but fewer contacts and fewer reciprocated contacts. This suggests that older participants are more likely to repeatedly provide to the same recipients. Finally, females have greater diversity in the services they exchange. Both HEP and CE are overwhelmingly female. As seen in the previous chapter, 83% of members in each Time Bank are women. Since females are the primary participants, they are shaping what goes on within the network as a whole. Male participants tend to exchange a narrower range of services.

Figure 5.8 summarizes the statistical models at CE. As evident, there are more statistically significant effects here. The impact of membership length is similar to the HEP case with the exception that length does not predict average hours of participation at CE. Income is the next most important predictor across the models. Those with lower incomes are more active at CE, having higher total and average hours of participation. Similarly, low-income members have more contacts and reciprocated contacts on average. This activity is also apparent in the fact that lower income participants have more credits (a higher balance) in their accounts on average. The only positive effect of income is with density. Those with higher incomes tend to have denser ego-networks (and this is likely due to their networks being smaller). It is particularly noteworthy that those who are most likely to be in economic need are most active in Community Exchange.

As seen in Figure 5.8, the account balance variable is the outcome that is predicted by the most independent variables. In addition to the income and length effects, we find that those who live alone, those who are employed, and those who are older have lower balances (fewer credits) on average. Given that these groups are no less active (notice the lack of statistically significant relations of these variables with both of the hours of participation variables), these findings indicate that these particular participants are receiving more services than their counterparts on average. As discussed earlier, most members have positive account balances, but living alone, employment, and aging result in lower give-to-receive ratios. It may be that these groups tend to offer fewer services or services that are redundant (offered by many) and therefore they are receiving fewer requests. They may also simply have greater needs.

Figure 5.8 also indicates that those who report that they are in better health have higher balances on average, providing more services than those in poorer health. This is similar to the HEP finding where those without disabilities have...
Figure 5.8 Summary of models of demographic variables predicting participation at CE

higher account balances. Age is found to be positively associated with density. Older members have contacts who exchange with one another more often on average. This is not an artifact of network size since age does not predict number of contacts. Our analyses later in this chapter will shed further light on this as we investigate who trades with whom.

We also find that those with higher education at CE have greater numbers of reciprocated contacts on average. This is the only effect that education has on participation (it was not significant in any of the HEP models). Perhaps better educated CE members are more likely to feel the need to reciprocate and create two-way relationships. Finally, female members tend to have fewer contacts (trading partners) and fewer reciprocated contacts. The average female member at CE exchanges with 13 different members whereas the average male member...
exchanges with 21 different members. There are no gender differences in the other participation variables. This indicates that female CE members are more likely to repeatedly exchange with the same members while males are exchanging with a greater variety of members. Females may be more likely to prefer a “familiar face” and are seeking social opportunities in addition to the services themselves.

Our results do not align with any of the findings from prior research reported earlier. Being unemployed had mixed effects in LETS research, but did not predict any participation activity in either of our cases. While the “permanently sick” were found to be the most active in other studies (Seyfang 2001a, 2001b), our disability variables did not predict average hours nor total hours in either of our cases. Finally, we found that low-income CE members are more active whereas previous research found that lower income participants provide services less often.

As we mentioned earlier, the methodological differences between our study and the previous research are substantial and ours is the most thorough investigation to date. We hope that our research on the transaction records of Time Banks will be replicated by future researchers in this area.

Demographics, Motivations, and Participation at HEP

As the reader will recall from Chapter 3, we fielded an extensive battery of motivation questions at HEP. This now enables us to determine whether the reasons that individuals joined HEP influence their participation in the Time Bank.

Multiple regression models were estimated with our seven motivation scales (see Figure 3.1) predicting our seven participation variables. In the final models, which also included the demographic variables as predictors, we found only three meaningful associations (see Methodological Appendix).

Those who joined HEP for altruistic reasons are more likely to have higher balances (credits in their accounts). Thus, those who joined to give to others are indeed more likely to do so, on average. They earn more than they spend. We also find that those who joined for altruistic reasons have less diversity in the services they exchange. This is also sensible as these members are not spending as much, confined largely to the service areas in which they provide. The last impact that motivations have upon participation also concerns the diversity of services exchanged. Those who joined HEP for social reasons are more likely to exchange a variety of different types of services as they seek to make social connections.

Exchange Networks at HEP and CE: Who Trades with Whom?

Now we move to the last section of our analyses of the transaction data at HEP and CE. We have not yet investigated who it is that members exchange with. Time Banks are often advocated (see Cahn and Rowe 1996, Seyfang and Smith 2002) for their potential to link together different types of people. Based on the demographic
composition of our cases and our earlier findings, we focus on three variables here: gender, age, and organizational status (see Methodological Appendix). Our previous analyses have focused mostly on individuals, but we cannot forget that organizations are members of Time Banks as well. Are members more likely to exchange with others who are similar to or different from themselves? To the extent that there is diversity in these connections, that is an indicator of “bridging” social capital. There are many potential benefits in such ties. For example, when older people are in contact with younger people there are possible health benefits (Thoits and Hewitt 2001). Such social integration increases the likelihood that the elderly in particular will feel needed or useful.

Table 5.1 provides the group membership analyses by gender. If all else is equal and transactions occur randomly, we would expect each group’s percentage of internal ties (contacts with members similar to themselves) to be about the same as their membership percentage within the Time Bank. When adding organizational members into the mix, HEP’s membership becomes 68% female. Here we see that 62.6% of all of the female’s trading partners are also female. Out of all of their contacts, 37.4% of women’s ties in HEP are with males or organizations (“external”). It is because HEP is mostly female that the majority of women’s contacts are women. This form of homophily (ties among similar people) is what makes HEP so unique.

<table>
<thead>
<tr>
<th></th>
<th>Internal Ties (%)</th>
<th>External Ties (%)</th>
<th>Proportion Internal (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>HEP</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>68.0</td>
<td>62.6</td>
<td>37.4</td>
</tr>
<tr>
<td>Male</td>
<td>22.1</td>
<td>16.4</td>
<td>83.6</td>
</tr>
<tr>
<td>Organization</td>
<td>9.9</td>
<td>10.3</td>
<td>89.7</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>100.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>CE</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>71.4</td>
<td>57.9</td>
<td>42.1</td>
</tr>
<tr>
<td>Male</td>
<td>20.9</td>
<td>20.6</td>
<td>79.4</td>
</tr>
<tr>
<td>Organization</td>
<td>7.7</td>
<td>7.5</td>
<td>92.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>100.0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4 This analysis is based on a common measure in social network analysis, the External-Internal (E-I) Index (see Krackhardt and Stern 1988, Hanneman and Riddle 2005). This measure concerns the attributes of who one is tied to – whether one’s alters are in the same group as ego (internal ties) or in a different group (external ties).
1 people) is known as “induced homophily,” representing the composition of the
2 organization (see McPherson and Smith-Lovin 1987).
3 Yet in HEP, we see that the percentage of internal ties for females is lower than
4 the membership percentage. So, although female members are mostly exchanging
5 with other women, they are actually slightly under-transacting with like others
6 compared to their membership size. We computed an additional measure to
7 help clarify. The last column of Table 5.1 (“Proportion Internal”) compares the
8 percentage of internal ties to the percentage of the membership, standardizing the
9 comparisons and making it easier to identify deviations. If the Proportion Internal
10 is less than 100%, that group under-transacts with their group. If the value is over
11 100%, that group tends to over-transact with members of their group.
12 As seen in the last column of Table 5.1, male HEP members under-transact with
13 other males, being more likely to have contacts external to their gender. At CE,
14 we see that female members are more likely to under-transact with other females
15 while males are very close to being representative of their overall membership
16 size. So, at HEP, males are more likely to generate bridging social capital, while
17 females are more likely to be tied to external groups at CE. Figure 5.9 provides
18 a sample sociogram to help visualize what these statistics are measuring. In this
19 example, we show a male CE member whose contacts are all “external.”

Figure 5.9 Select sociogram: Ego-network of male CE member who has
exchanged only with females and an organization
Table 5.2 Who Time Bankers exchange with: Internal and external contacts by age

<table>
<thead>
<tr>
<th></th>
<th>Internal Ties (%)</th>
<th>External Ties (%)</th>
<th>Proportion Internal (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HEP</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than 25</td>
<td>8.6</td>
<td>94.9</td>
<td>59.4</td>
</tr>
<tr>
<td>25-34</td>
<td>23.3</td>
<td>79.1</td>
<td>84.3</td>
</tr>
<tr>
<td>35-44</td>
<td>19.1</td>
<td>81.4</td>
<td>109.2</td>
</tr>
<tr>
<td>45-54</td>
<td>17.1</td>
<td>89.1</td>
<td>108.5</td>
</tr>
<tr>
<td>55-64</td>
<td>11.2</td>
<td>93.2</td>
<td>97.0</td>
</tr>
<tr>
<td>65 or more</td>
<td>5.3</td>
<td>127.8</td>
<td></td>
</tr>
<tr>
<td>Organization</td>
<td>9.9</td>
<td>103.9</td>
<td></td>
</tr>
<tr>
<td>CE</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than 25</td>
<td>4.7</td>
<td>93.3</td>
<td>142.4</td>
</tr>
<tr>
<td>25-34</td>
<td>5.8</td>
<td>91.8</td>
<td>142.2</td>
</tr>
<tr>
<td>35-44</td>
<td>11.2</td>
<td>91.4</td>
<td>76.6</td>
</tr>
<tr>
<td>45-54</td>
<td>17.7</td>
<td>78.0</td>
<td>124.5</td>
</tr>
<tr>
<td>55-64</td>
<td>15.0</td>
<td>80.3</td>
<td>131.2</td>
</tr>
<tr>
<td>65 or more</td>
<td>15.8</td>
<td>78.0</td>
<td>138.9</td>
</tr>
<tr>
<td>Organization</td>
<td>7.7</td>
<td>92.5</td>
<td>97.1</td>
</tr>
</tbody>
</table>

Table 5.2 provides a similar analysis by age group. At HEP, the youngest members are the least likely to trade with others within their age group, particularly those less than 25 years of age. On the other hand, elderly HEP members over-transact with other members who are 65 or older. At CE, those aged 35-44 under-transact with others in their age group while all other individual members over-transact with people in their own age group.

It is interesting that at CE, the youngest age groups are more likely to transact with individuals of similar ages and at HEP, the youngest age groups are more likely to transact with members outside of her or his age group. The younger CE members are more likely to "bond" with one another whereas the younger HEP members are more likely to "bridge" with others. To help visualize these statistics, another sample sociogram is provided as Figure 5.10. This is the exchange network of a HEP member who is less than 25 years of age and who has traded services only with those outside of their age group (all of the contacts are "external"). The symbols of the nodes are distinct for each group to help illustrate these bridging connections.

Now, that we have investigated gender, age, and organizational status separately, we will combine them in the final analysis to get even more specific in analyzing who trades with whom. Table 5.3 is essentially a combination of Tables 5.1 and...
Figure 5.10 Select sociogram: Ego-network of young HEP member who has exchanged only with members outside their age group

5.2. Here we can see that among the youngest HEP members (less than 25 years of age), males are less likely to have internal ties than females (comparing 56.1% to 64.9% in the Proportion Internal column). Also, males aged 35-44 are much less likely to have trading partners from their own age/gender group while females aged 35-44 over-transact with members who are similar to them. The same trend is evident for HEP members aged 45-54. The opposite is the case in the 55-64 age group. Here, female HEP members are more likely to trade outside of their 30 age/gender group while males over-transact inside their age/gender group. Among elderly (65+) HEP members, females over-transact with other older women while none of the elderly male members (there have been 20 throughout the history of 33 HEP) has ever traded with another older male participant.

Table 5.3 indicates that male CE members aged 45-54 are the age/gender group that are most likely to have internal ties. As in the case at HEP, some male CE 36 participants have no internal ties. All of the CE males less than 25 years of age and those aged 25-34 have yet to exchange with another member in their same age/gender group. Among women, females less than 25 years of age over-transact with members similar to themselves while females aged 35-44 are more likely to have external ties.

We conclude this section by providing sample sociograms which represent the average HEP and CE member according to their network size (number of contacts) and their percentage of internal ties. We also include the total number of hours of 44
<table>
<thead>
<tr>
<th>Table 5.3</th>
<th>Who Time Bankers exchange with: Internal and external contacts by age and gender</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(%</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>HEP</td>
<td></td>
</tr>
<tr>
<td>Female Less than 25</td>
<td>6.6</td>
</tr>
<tr>
<td>Female 25-34</td>
<td>17.3</td>
</tr>
<tr>
<td>Female 35-44</td>
<td>14.1</td>
</tr>
<tr>
<td>Female 45-54</td>
<td>13.7</td>
</tr>
<tr>
<td>Female 55-64</td>
<td>8.7</td>
</tr>
<tr>
<td>Female 65 or more</td>
<td>4.2</td>
</tr>
<tr>
<td>Male Less than 25</td>
<td>2.1</td>
</tr>
<tr>
<td>Male 25-34</td>
<td>6.0</td>
</tr>
<tr>
<td>Male 35-44</td>
<td>5.0</td>
</tr>
<tr>
<td>Male 45-54 yrs</td>
<td>3.4</td>
</tr>
<tr>
<td>Male 55-64 yrs</td>
<td>2.5</td>
</tr>
<tr>
<td>Male 65 or more</td>
<td>1.1</td>
</tr>
<tr>
<td>Organization</td>
<td>9.9</td>
</tr>
<tr>
<td>CE</td>
<td></td>
</tr>
<tr>
<td>Female Less than 25</td>
<td>3.0</td>
</tr>
<tr>
<td>Female 25-34</td>
<td>4.6</td>
</tr>
<tr>
<td>Female 35-44</td>
<td>9.4</td>
</tr>
<tr>
<td>Female 45-54</td>
<td>14.4</td>
</tr>
<tr>
<td>Female 55-64</td>
<td>12.3</td>
</tr>
<tr>
<td>Female 65 or more</td>
<td>11.8</td>
</tr>
<tr>
<td>Male Less than 25</td>
<td>1.8</td>
</tr>
<tr>
<td>Male 25-34</td>
<td>1.2</td>
</tr>
<tr>
<td>Male 35-44</td>
<td>1.8</td>
</tr>
<tr>
<td>Male 45-54</td>
<td>3.3</td>
</tr>
<tr>
<td>Male 55-64</td>
<td>2.8</td>
</tr>
<tr>
<td>Male 65 or more</td>
<td>4.1</td>
</tr>
<tr>
<td>Organization</td>
<td>7.7</td>
</tr>
</tbody>
</table>
services that the members have exchanged with one another (the ties are “valued” in these diagrams). The average HEP member has approximately 9 contacts and 11% of those are within their own age/gender group. In Figure 5.11 we highlight a female member aged 55-64 (near the middle of the figure). She has exchanged with one other member in her age/gender group. This is a reciprocal relationship in which this average member (ego) has provided 12.5 hours of service to this alter who has provided a one hour service to ego. This member’s 8 other contacts are all outside of her age/gender group. Notice that several of this member’s trading partners appear to be very active HEP members given the large number of hours being exchanged between some alters.

Figure 5.12 provides a sociogram for a member approximating the CE average of 8 contacts and 13% internal ties. This is a female aged 45-54 who has traded with only one other member in her age/gender group (she received 3 hours of services from that alter). This member is most likely to exchange with male CE members. She has provided 2 hours of services to a male who is 65 or older. She has received a total of 6 hours of services from her other three male alters. She has provided the most hours of services (6) to an organizational member from whom she also received 5 hours of services. Again, notice that several of this member’s trading partners are more active in CE given the number of hours exchanged among this member’s alters.

This section has gotten very detailed as we investigate who trades with whom. Our primary theoretical lens here has surrounded two major forms of social capital. Trading with members who are similar to oneself is an indicator of bonding social capital while trading with members who are dissimilar is an indicator of bridging.
Figure 5.12 Select sociogram: Ego-network of CE member with average network size and percent internal ties

24 social capital. We learned that female HEP members aged 65 or older are most likely to trade amongst themselves, creating bonding social capital. At CE, male members aged 35 and older are all more likely to have internal ties. As far as bridging social capital, we find that younger male HEP members are most likely to trade with those outside of their age/gender group. At CE, females aged 35-44 are most likely to trade with different types of members. As we noted at the outset, these analyses are exploratory. There is no relevant previous research and few theoretical guides for us to make predictions about such connections in Time Banks. Moreover, our findings across our two cases here are dramatically different. All of the findings point to the fact that these networks are not random. There are two different “choice” mechanisms at work in local currency networks. First, members seek out particular services, they do not randomly select services or providers. To the extent that there is a gender and/or age division of labor in service provision, we would expect trading partners to reflect that. Second, members choose particular members because they know them and want to spend time with them. It is impossible, with the data we have collected, to distinguish which of these two dynamics are more salient in our two cases. There are other limitations to transaction data as well.
Limitations of Transaction Data

As others have noted (Seyfang 2001a, Lasker et al. 2011), transactions records are far from perfect. Since maintaining a certain balance is not required for those wanting services, the incentive to keep accurate records is not very high. Many members, as we have seen, have large balances and may not bother reporting all of their hours. Perhaps the biggest irony of unreported hours is that it is sometimes the result of the successes of Time Banking itself. As members get to know each other better and establish relationships with those with whom they are exchanging, recording transactions with friends may begin to seem unnecessary or even inappropriate. Technology may also play a role in underreporting. While in the early days of Time Banking, service exchanges were most often arranged through and recorded by staff, today most of this activity is done by members themselves. Specifically, it is the responsibility of the provider of the service (the one earning the Time Dollars) to report the service she or he provided. The availability of online software makes this possible, and it alleviates a very time-consuming task for the coordinators. Yet for some members, using the Internet is problematic by virtue of poor access or unfamiliarity; in those cases, they can request that the coordinator enter the information, but they may not want to go to the effort. For some, even entering information online takes time and effort that may not seem worth it. Others simply forget to do so.

The prevalence of non-reporting was estimated through our membership surveys at both HEP and CE. At HEP, the following question was fielded: “Have you ever provided a service to a member and not reported your time to the office (and therefore not collect the Time Dollar(s) you earned)?” The majority of respondents (56.8%) state they have never failed to report their time, 22.5% have not reported on one or two occasions, 14.1% have not a few times, and only 6.6% say this has been the case many times. In the CE study, about 60.7% responded that they always reported transactions, 14% said about three-quarters of the time, 6% said about half of the time, 6.7% said about one-quarter of the time, and 12.7% said they rarely or never did.

In our HEP survey, we also asked members about the importance of Time Dollars and whether they would still participate in the network if there were no alternative currency (hours) and the system was just a network of pure volunteers. There was tremendous variation in the responses to this question. About one-quarter (23.1%) reported that they were “not at all” likely to continue under this scenario, 29.0% reported they were “a little” likely to continue, 24.9% said “somewhat,” and 23.1% reported that they were “very likely” to continue in a purely voluntary network. So, the currency, the credits themselves, are quite important for some and not at all for others, and this is surely reflected in patterns of recording transactions.

From the point of view of analyzing what goes on inside Time Banking, we must consider that while the transaction data that we have reported on here reflects member’s official Time Dollar balances and activity, it is most likely an
1 underestimate of the exchanges that occur among members of these Time Banks.  
2 It is not possible to know how underreporting might bias the results in terms of  
3 types of services exchanged or in the analysis of networks.  
4  
5  
6 Member to Member Participation  
7  
8 Throughout this chapter we have focused solely on HEP and CE. We also have  
9 participation information available from our surveys at M2M. As we have  
10 discussed throughout, this embedded Time Bank with a restricted membership  
11 is quite different from HEP and CE. This is also the case in how transactions are  
12 arranged. At M2M, the coordinator serves as the matchmaker. Whereas in CE  
13 and HEP, most of the matches are made by members themselves, in the M2M  
14 program, the staff does the searching of member profiles and service requests to  
15 find appropriate matches. M2M staff also follow up with recipients after a service  
16 is provided so that they can record the Time Dollar exchange. Therefore, all of the  
17 exchanges matched by M2M staff are recorded. Given the nature of the program  
18 and its members, it does not appear that self-arranged, nonreported transactions  
19 are common.  
20 In our retrospective survey, M2M members were asked how often they provide  
21 and receive services in the program. Over half (58.1%) of the respondents reported  
22 that they have never provided services. These are mostly frail participants who  
23 joined the program in the recipient role and also includes some intending to provide  
24 services who had not yet participated. One-third (33.5%) of the respondents report  
25 providing services once a week or more. Members tend to provide very regularly  
26 or not at all (less than 5% are in either the “several times a year” or “monthly”  
27 categories). Just over half of our respondents (52.7%) report having never received  
28 a service. Again, most of these are participants who joined in the provider role, but  
29 there are some intending to be recipients who had yet to participate. Of those who  
30 have received services, the frequency with which they get those services varies  
31 quite a bit: 16.8% responded “once a month or less,” 4.8% said “several times a  
32 month,” 21.6% reported “once a week,” and 4.2% said “several times a week.”  
33 So, one-third of M2M members report that they provide services and one-  
34 quarter receive services on at least a weekly basis. These members are definitely  
35 active participants. How does it compare to what we found in the transaction data  
36 at HEP and CE? While the metrics and data are very different, the M2M results  
37 look roughly comparable in our estimation. Since one hour is the most frequently  
38 reported time exchanged (length of service) in both HEP and CE, “weekly” would  
39 imply at least about 13 hours per quarter. As we saw above (Figure 5.2), 22% of  
40 HEP members and 26% of CE members have average quarterly participation times  
41 of 10 or more hours.  
42 Our other two measures of M2M participation concern service diversity, the  
43 number of different services reported to be provided and received. Notice the  
44 remarkable similarity of the pie charts in Figure 5.13. Of those who have provided,
Figure 5.13 Service diversity at M2M: Number of different services exchanged, retrospective survey

35.4% have only provided one type of service. Of those who have received, 33.8% have only received one type of service. About 30% have provided or received two or three different types of services. As we saw in Tables 4.3 and 4.4, the service types from the M2M surveys are very specific. Overall, nearly two-thirds of M2M members provide or receive only a few different types of services. As expected, this embedded Time Bank with a restricted membership has a limited number of services available to its members.

Demographics and Motivations as Predictors of M2M Participation

As in the cases of HEP and CE, we now estimate statistical models to assess how participation varies among M2M members. We begin by testing the impact of our demographic variables upon the four measures of participation. Figure 5.14 summarizes the results of these four multiple regression models (see Methodological Appendix). First, we see that female M2M members are more likely to report providing services more often than males. Older members, disabled members, and those in poorer health are less likely to provide services and also provide a lower range of services. Conversely, as we would expect in this program, older members, disabled members, and those in poorer health are more likely to receive services more often. Finally, older members and those in poorer health are also more likely to receive a greater variety of services.

The findings surrounding age, disability, and health status all meet our expectations, indicating that those who are more frail and in need are less likely to provide and more likely to receive. We did not anticipate the gender effect though. Why are female M2M participants more likely to provide more often? We know that it is not attributable to any gender differences in age, disability, or health status at M2M since these variables are controlled for in the models. Perhaps women are more likely to provide services than men because of the matching process. As discussed in Chapter 2, M2M coordinators contact providers when recipients are in need of services. It may be that female members are asked to provide services.
more often than men. Given the gender division of labor, it is possible that women are more likely to offer the most in-demand services in the Time Bank. Now that we have investigated the impact of demographic variables upon participation at M2M, we can incorporate motivations. The five motivation items that we fielded in the retrospective survey (see Table 3.3) were tested for the impact that they have upon the four participation variables (see Methodological Appendix). Of the twenty associations tested, only one was statistically meaningful. Those providers who report joining for altruistic reasons ("to help others") are more likely to provide a greater variety of services. In fact, those motivated by altruism provide more than twice the number of services on average compared to those who did not join for altruistic reasons. So, those who join to "give back," provide a variety of services to members. It is interesting that we found the opposite in the HEP case above. There, those who joined for altruistic reasons have less diversity in the services they provide and receive. Despite the differences in data measurement and in these programs, these opposite results do highlight the salience of altruism in Time Bank participation. Overall, in both cases, motivations play very little role in shaping participation. It is interesting that altruism does so in both.
Discussion and Conclusion

This chapter has explored the major aspects of member participation in Time Banking. When looking at individual members’ activities, HEP has had more marginal participants as nearly one-third of its members average only one hour or less per quarter. While HEP has been and continues to be a larger Time Bank than CE, members in the former tend to be less active. We will return to this question in the concluding chapter when we explore some of our data on the limitations to participation in Time Banking. For now, it is important to recognize that differential participation is substantial in Time Banks and overall membership numbers exaggerate what actually occurs in Time Banks.

We also found that debt at both HEP and CE is relatively rare. The vast majority of members have no debt and are not taking advantage of the ability to run negative balances in Time Banks. This is strong evidence to counter some of the skeptics. Our data indicates that the Time Banking idea works. Members do not appear to be taking advantage of the ability to get “free” things. Assumptions made by mainstream economists about “rational actors” do not seem to apply to Time Banking. The rational actor model assumes that people attempt to maximize their returns while minimizing their investment. Debt would be a much more serious problem if this were the case in Time Banks. The rational actor model would also assume that people would be motivated to provide “cheap” services (those that are inexpensive in the formal economy) in the Time Bank and buy ones that are expensive in the paid economy. While our data would not make this proposition easily testable, we assume that since debt is not problematic, this type of disparity is not likely to be widespread either.

In our investigation of the determinants of participation, we found that low-income CE members are more active; exchanging more often, having more trading partners, and having more credits in their accounts. Given Time Banking’s economic empowerment objectives, these results demonstrate the potential of these networks. Our demographic analysis also indicates that female members are more likely to exchange more diverse services at HEP, are likely to have fewer contacts at CE, and are more likely to provide more often at M2M. An unanswered empirical question is whether the strength of women’s numbers in these systems and the strength of their commitment may deter men from joining. Age dynamics are also important in all three of our cases. Older members are more likely to have higher account balances at HEP, but lower balances at CE. At M2M, the oldest members are more likely to receive more services and a variety of them, and less likely to provide. Future researchers as well as local currency practitioners should consider the implications of differential participation by income, gender, and age.

Our motivations analyses at HEP and M2M indicate that the reasons people join Time Banks do not play a large role in shaping their participation in them. We found few statistical associations, the most meaningful surrounding altruism. Despite the differences between traditional volunteering and Time Banking that we discussed in the first chapter, altruism does cause some to join and shapes
participation. This suggests that coordinators need to stress the importance of spending Time Dollars, asking for services. If too many members desire to only "give back," Time Bank activity diminishes since it is the service recipient who usually initiates the transaction. The irony of altruistic Time Bankers is that they inadvertently prohibit other members from "giving back" by not spending the currency themselves.

Our social network analysis in this chapter also highlighted some interesting differences between HEP and CE. At HEP, male members under-transact with other males while at CE, female members under-transact with other females. Elderly HEP members over-transact with other older members while younger CE member over-transact with other younger people. The reasons underlying these trends are not very clear to us. Our results suggest that overall, HEP is generating more bridging social capital while CE is creating more bonding social capital.

This chapter provides the most thorough investigation of Time Bank participation to date. By focusing on the various key indicators measuring the engagement of members, we have provided a detailed overview of what happens within these networks. Despite our thorough analysis of HEP and CE Time Dollar activity, it is ironic that we also see that the local currency itself is somewhat meaningless. Time Bank organizations tend to spend freely, remunerating members for a variety of services to the organization, and are in substantial debt. One of the secrets of Time Banking is that the credits are simply a mechanism to promote people helping each other. In this regard, we now turn our attention to the outcomes of Time Banking.
Methodological Appendix

Table A5.1 Descriptive statistics of key indicators of member participation at HEP and CE

<table>
<thead>
<tr>
<th>Variable</th>
<th>TB</th>
<th>Mean</th>
<th>Median</th>
<th>Mode</th>
<th>Std Dev</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Hours</td>
<td>HEP</td>
<td>85.62</td>
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HEP N = 1807; CE N = 1010

Membership Length and Average Hours Computation

Membership length was computed by subtracting the date of a member’s first transaction from the date of their last transaction to determine days participated. This result was divided by 91.25 (the number of days in an average quarter) to get number of quarters of participation.

The average hours variable was computed by taking a member’s total hours of engagement (earning and spending Time Dollars) and dividing it by the number of quarters they have participated.

Correlations among Participation Variables

In testing for associations, we employ the continuous, numerical versions of these variables (rather than the categorical versions illustrated in Figures 5.1, 5.2, and 5.3). The correlation coefficient (Pearson’s r) is the most appropriate statistic to test for associations among numerical variables. Pearson’s r ranges from -1 to +1 with...
indicating no linear association. Since the participation variables are derived from complete population data, there is no need for tests of statistical significance in Table A5.2 below. According to Healey et al. (1999), values of Pearson’s $r$ ranging from .10 to .29 can be considered as “moderate” associations while those .30 and higher reflect “strong” associations.

**Table A5.2**  Pearson’s $r$ correlation coefficients among participation variables at HEP (lower left) and CE (upper right)

<table>
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<th>Community Exchange</th>
<th>Hour Exchange Portland</th>
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<tr>
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<td>Diversity</td>
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</table>

*Regression Models Predicting Participation from Demographics (Figures 5.7 and 5.8)*

All of the model assumptions of multiple regression were met and multicollinearity did not pose a problem. The sample size for the HEP models is 235, for CE models it is 158. At HEP, 10 of the 13 associations are statistically significant at $p<.05$. Three associations are significant at $p<.10$ and were confirmed in additional analyses. At CE, 16 of the 20 associations are significant at $p<.05$. Four association are significant at $p<.08$ and were confirmed in additional analyses. The strength of all of the associations in both figures are at least “moderate/worth noting” (see Healey et al. 1999) as the beta-weights range from .10 to .29. At HEP, length has “strong” effects (beta-weights exceeding .30) in four of the models. At CE, length has “strong” effects in four of the models and income has “strong” effects in two of the models.

*Regression Models Predicting Participation from Motivations and Demographics at HEP*

Three statistically significant ($p<.05$) associations were found between the motivation scales and the participation variables when controlling for the
demographic variables in the models. The strength of all three associations is in
the “moderate” range (beta weights are .10 - .29).

Who Trades with Whom Analysis

Based on our findings of the composition of Time Banks (see Chapter 3), we
determined that gender, age, and organizational status are the three most important
variables to consider when investigating who trades with whom.

Regression Models Predicting Participation from Demographics at M2M
(Figure 5.14)

All of the model assumptions of multiple regression were met and multicollinearity
did not pose a problem. The sample size for these four models is 153. Our six
demographic variables (gender, age, marital status, living situation, health status, and
disability status) were tested as predictors of our four participation variables. All
of the statistically significant association reported in Figure 5.14 are significant
at p<.05, with the exception of Female:Frequency of Providing (p=.055) and
Age:Frequency of Receiving (p=.057). The strength of all significant associations
is in the “moderate” range (.10 - .29).

Models Predicting Participation from Motivations at M2M

As discussed in Chapter 3, the motivation items were fielded only to M2M
providers in our retrospective survey. Thus, given the low sample size on these
items (n = 61), we were only able to test for bivariate associations between the five
motivation variables and the four participation measures. To do so, we ran twenty
t-tests. The one that was statistically significant (p<.05) indicates that those who
joined to help others have exchanged 4.02 different services on average compared
to 1.90 for those not stating this reason.