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WHICH CHARACTERISTICS OF COMMUNITIES BOOST TIME-BANKING?
CASE STUDY OF THE UNITED STATES

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ABSTRACT

This paper empirically examines the characteristics of communities with successful time banking schemes. Dataset for this study consists of 909 counties in the U.S, 314 of these counties employ a time-banking currency. The selected factors in this study are captured by 13 variables that affect the number of exchanged hours, namely income inequality, social security, unemployment rate, a set of poverty and income variables and various industry composition indicators. This paper aims to statistically model which specific characteristics of local communities significantly impact the number of hours exchanged. The research especially focuses on the factors of inequality and poverty. The hypothesis tests the assumption that an increase in hours exchanged corresponds to higher income inequality, higher unemployment density, and social-security benefits to constituents. The outcome of the model partially contradicts this hypothesis. The findings indicate a higher portion of impoverished, low-income families as well as an increase in the income inequality variable to negatively affect the number of hours exchanged. Oppositely, in line with previous literature, the result of the model supports joblessness and social security as positive indicators and reveals retail-trade as a significant factor for the successful operation of a time bank. More thorough examination of such findings discloses reasons behind such patterns. A suitable policy is proposed in the end of this paper.

KEYWORDS

Alternative currency, Social movements, Time banks, Cross-Sectional analysis

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1. INTRODUCTION

The time-banking movement's chief objective is to help unemployed, impoverished and marginalized individuals. It is a small but significant social revolution which helps societies worldwide. The United States belongs among capitalist societies distressed by these issues of poverty, discrimination and long-term unemployment.

At the beginning of the twenty-first century, the United States began to experience an increase in extreme poverty of families mostly composed of single mothers with children living on less than two dollars a day. This destitution is mapped for the time period from 1996 to 2011 (Pager & Shepherd, 2008). Shaefer & Edin (2013) mention during the same time period an unexpected increase in the share of single mothers joining the workforce. Another difficulty has become income inequality, specifically the top three per cent of Americans holding more than the poorest 90 percent of families (inequality.org).

These negative manifestations within a developed capitalist economy have prompted social activists to launch time-banking schemes. More than four hundred time banks currently operate in the United States. This type of complementary currency is specifically designed to fight social decadence. Ed Collom (2005) states that the chief goal of these grassroots movements is to help individuals on the outskirts of the society. The evaluation of an individual's time, where one hour equals one time-credit, attempts to initiate social cooperation regardless of one's income. Every participant is motivated to find his or her skills to offer in this alternative market. Individuals of the mainstream labour market, along with minorities, find their new potential to succeed by interacting with other participants of the time bank.

Seyfang (2003) reveals time currency to be of minor importance to the users. It is the formation of informal mutual help, the creation of new weak ties and community-building that constitutes the reasons for participation. Although the membership of these time-banks is relatively small, it provides a building block for stronger social networks, tackles issues of social exclusion in deprived areas, boosts mutual cooperation along with civic engagement and promotes social capital (see North, 2010, p92). The effect of this movement could potentially be enormous. Local community networks, with strengthened ties among participants, as well as between them and their community, might help create a more resilient community, less dependent on a conventional competitive market.

The origin of this type of complementary currency can be traced to the 1980s when attorney Edgar Cahn presented Time Dollars in Miami, Florida with the intention of improving the wellbeing of older people (Cahn, 2000). Since then the number of time banks has sky rocketed from one in the 1980s to over four hundred currently circulating (community.timebanks.org). According to Cahn, five new time banks have emerged every week in the U.S. since 2012 (Cahn, interview cited in Lietaer & Dunne, 2013, p. 81). Collom (2005), Seyfang (2002) and North (2003) describe time-banking as more successful at surviving than LETS and Hours systems. The number of time banks in operation continuously rises. Collom (2007) finds 59 time banks in the U.S., Collom et al. (2012, p. 53) identifies 128 active time banks and in 2014 I encountered over 400 of these systems.

Despite the pace of their emergence and the sizable amount of active time banks, the concept of time-banking still remains empirically an under-researched area. Collom (2005) provides a quantitative analysis, however, for community currencies in the United States. Collom (2007) also describes the factors affecting membership to an American time bank, by analysing the answers of a questionnaire given to 505 members. The most extensive study on time banks in the U.S. is from Collom et al. (2012).

This study adds to the body of knowledge on this topic with new findings from a thorough quantitative analysis of the socio-economic context of counties in which time banks seem to prosper the most in the United States. To meet this ambitious task, a cross-sectional method, with 13 exogenous variables, is applied to a dataset consisting of 909 counties. The outcome of this study contradicts previous studies such as Collom et al. (2012) and includes new variables of interest such as income inequality, social security or industry composition.

The outline of the study is as follows. To begin with, the literature review summarizes the previous findings on this topic, followed by the methodology section. A discussion of the results summarizes the findings of the empirical model. Finally, conclusion of the study can be found in the end of this paper.

2. LITERATURE REVIEW

Over fifteen thousand participants of time-banking in the United States have provided one hundred and fifty thousand exchanges with a value of over 1.5 million hours of beneficial services (community.timebanks.org). The prevalence of time bank patronage in communities throughout the United States justifies an inquiry into the socio-economic characteristics driving their prosperity. Interest in the economic characteristics is derived from their importance as an initial driver for participation. Collom (2007) and Collom et al. (2012) reveals the most crucial motivation for joining a time bank as the expansion of one's purchasing power. Respondents consider the "needs motivations" to obtain necessary goods and services (G&S) a more powerful reason than "values motive" for joining time banks (Collom, 2007; Collom et al., 2012).

Answers to the inquiry about suitable conditions for prosperity of a time bank could then assist a policy maker when deciding on a community for the adoption of a pilot time-banking project. Organizers of already existing time banks could better understand the reasons behind the size of the rates of exchange.

To unveil those desirable factors and form expectations about their effect, we need to first look behind the scenes of time-banking for some common patterns. As already mentioned, the initial reason for launching time-banking projects was the goal to provide the elderly with essential services (Cahn, 2000). Provision of help from young generations to older ones supports intergenerational relations (Collom, 2008). Evidence also highlights the ability of time banks to involve marginalized people with health problems or otherwise socially excluded individuals in order to gain mutual help (North, 2010, p. 88). A study by Seyfang (2006), describing London's time bank, supports the idea of time-banking as an empowering tool for socially excluded groups. Seyfang (2003) also understands the importance of social characteristics for analysing the composition of a time bank's membership. More than half of the participants of a UK Time bank are from ethnic minorities and almost half are disabled or have long-term limiting sicknesses (Seyfang, 2003). In this study, the "SocSecurity" variable reflects the percentage of the population receiving social-security benefits representing an instrument for marginalized, disabled but also retired individuals.

Seyfang (2003) contributes to the studies about the composition of the membership. According to Seyfang, 30 per cent of the elderly and 71 per cent of women constitute the membership of a UK time bank. North (2010, p.98) finds about 58 per cent of time-banking participants are women. Similarly, Carnero et al. (2015) shows a local Spanish currency's most common representative user as a female who is, single, middle aged, highly educated and unemployed. They find a clear trend between the unemployment rate in Spain and the number of individuals registered in Spanish time banks. The study explains the high level of female participants due to women's more frequent ejection from the labour market, and views the time bank as an opportunity for unemployed participants to enter the new labour market with the use of this currency (Carnero et al., 2015). Although Collom (2012) does not find unemployment rate as a predictor of participation in three studied American time banks, Seyfang (2003, p. 702) reveals 80 percent of the UK Time bank members are jobless. Additionally, Collom (2005) mentions unemployment as a significant indicator of the environment where local currency movements organize. The unemployment rate, as the first mentioned economic factor potentially affecting time-banking projects, enters the regression equation of this study.

Collom research (2007) reports time bank members as white, highly educated females with low incomes. Such study parallels with the article of Williams (1996a) in terms of a representative participant of a local currency being a highly educated low-income individual. Alike, Seyfang (2006, p.6) and Seyfang & Smith (2002) report 58 per cent of participants in the UK time-banks as households with income below 10 000 pounds a year. The evidence for the Dane County Time bank indicates over 20 per cent of the Time bank's membership to fall below poverty level (North, 2010, p. 97).

The character of the time-banking currency itself, where one's hour is valued equally, deters more demanded skilled services (Lee at al. 2004). In turn, this currency is suited to help poor less skilled individuals without viable opportunities in the mainstream economy. Collom (2012) identifies members of three analysed American time banks living on a low income. The empirical study of Collom (2005) also reports poverty next to household income and unemployment rates as significant characteristics of the environments where local currencies tend to operate. In questioning the direction of the effect of low-income membership on exchanged hours, the quantita-

tive part of Collom's research signals low-income participants as more active in the Community Exchange time bank (Collom, 2012, p. 124). The inclusion of the unemployment variable into the model in this study will enable the testing of the link between exchanges in a time-bank currency and the proportion of poor individuals in a county.

Income inequality, as a possible determinant of time-banking membership, constitutes another variable analysed in this study. The equal valuation of an individual's hour in a time-banking scheme offers a vision of equality among members in times when current monetary systems, with interest-rate yielding currencies, aggravate the wealth concentration into the hands of a few (Lietaer & Dunne, 2013, p. 49). In the scenario of high income-inequality, big corporations are aware about their negotiating power in terms of setting wages for highly competitive low-paid jobs. As more and more individuals fall under the poverty line and are desperate for work, the corporations are free to reduce salaries for longer hours of work. As a consequence, income inequality can divide communities, harshen neighbourly relationships and pressure citizens to base opinions according to one's accumulated income.

As consequence, marginalized, excluded, less fortunate individuals might miss a bridging element to obtain necessary resources or aid from others. Time banking offers an opportunity to lessen the distressing effects of income inequality on a society. It supports an exchange of free of national currency and interest-rates, connecting the needs of marginalized individuals with offers from others regardless their income status (North, 2010). In a similar way, the local currency Green Dollars helped underemployed individuals during neoliberalization in New Zealand (North, 2007, p. 129 – 148).

North (2014) argues another local-hour currency, Ithaca Hours, which like time-banking projects, aims to provide additional income to impoverished individuals. Ithaca Hour's chief objective is to mitigate wage inequality in the city of New York (North, 2014). Lietaer & Dunne (2013, p. 185) also note the tendency of local currencies to distribute wealth rather than to concentrate it. Regarding specifically time-banking projects, the equality vision of time-banking schemes itself might help to boost membership (North, 2010, p. 93). The time-banking regime increases dependence of income upon the length of work rather than upon one's evaluation of provided goods and services (Boyle, 2002; Seyfang, 2006, p.787). The importance of the idea of equality, behind the success of time-banking schemes, will be tested with an income-inequality variable representing an exogenous variable in the model.

Industry-composition represents the last characteristic of a county contributing to the success of a time bank. Given the lack of literature questioning this factor, various industry categories are examined, ranging from agriculture, forestry, hunting, mining and fishing, construction, manufacturing, wholesale trade, retail trade, transportation and warehousing and utilities, information, finance, insurance and real estate, rental and leasing, professional scientific services and management, administration and waste management, education, health care and social assistance, arts, public administration and other services. The prior expectation concerns retail trade as a significant variable since local businesses appear to be important members entering transactions with other local currencies (See North, 2007; Seyfang, 2003; Collom, 2007).

The empirical analysis in this study will incorporate these factors supported by the previous literature to test their significance for the success of the time-banking schemes. The success is then defined by the number of exchanged hours between members of the time bank. This approach focuses on the efficiency factor. One could argue that the number of exchanged hours is not the characteristic that identifies the most favourable outcome for time banks. Cahn & Gray (2013) note the evolution of time banks away from their original focus on mere efficiency to help win "the war on poverty," towards more normative principles. Nevertheless, given the short period for which time-banking schemes operate on average in the United States, as will be shown later, time banks need to focus on efficiency to survive and subsequently be able to serve some additional principles.

3. DATA & METHODS

The literature review identifies a time-bank's objective is to help marginalized groups, improve civic participation rate and offer an alternative way of exchange to low-income and/or unemployed individuals. This study in turn aims to empirically analyse if next to other selected characteristics, time-banks tend to succeed in counties with a

high unemployment rate, a significant percentage of impoverished individuals or with a sizable portion of receivers of social security. The outcome identifies 13 significant socio-economic characteristics of counties as important factors affecting the success of time-banking projects.

Such an ambitious collection of data was accumulated from various sources. The dataset for this study composes of 909 American counties. Socio-economic variables for this dataset are available on the website of the American community survey. Collection of the variables pertaining to the number of exchanged hours originates on the Community Time banks website. The method of data collection for the length of an operation of a Time bank consists of a record analysis. The collection of this dataset relates to the end of the year 2014.

Representing the hypotheses presented above, data for the following indicators were gathered for every county: Exchanged Hours, Circulation, Population, Unemployment, Retail-trade, Poverty, Poverty of Families, Poverty of Young Families, Poverty of Married Couples, Poor Families, Wealthy Families, Inequality, Income and Social Security. The description of these variables can be found in the Appendix.

In terms of the methods used, the cross-sectional data for 909 American counties enabled the construction of a regression model. According to the Harvey-Collier test, the true relationship between endogenous and exogenous variables is linear. Therefore, the regression model takes the form of a linear regression. The variables enter the regression equation in their original form except for the Income variable. The Income variable is log-transformed for interpretation purposes as all other income and poverty variables are expressed in percentages. The statistical significance of the Income variable appears unchanged regardless of its form.

As the models do not display any misspecification problems and the diagnostic tests prove the estimators to be "BLUE", the models estimated are a rather simple version of a cross-sectional regression. Simultaneity also should not be a threat since the calculation of economic determinants on the American community survey website does not include the operation of time banks along with the circulation of time dollars.

Exchanged Hours is then the only endogenous variable. It appears as the same one in all of the models. This dependent variable measures an average number of exchanged hours per time bank in a county. Every model varies from the previous one by the composition of the included exogenous variables standing for poverty or income indicators. Only one of these sets of factors enters a single model to control for multicollinearity.

The summary statistics of the variables from all models are presented in the Appendix, Table 1. The data itself provide an interesting insight. An average longevity of an American time-bank operation is one and half year. The longest currently circulating time dollars pertain to Sobrante Park Time banking in Oakland, California. The most successful documented time bank, in terms of hours exchanged, is Ward County time bank with 1,000,535 hours exchanged. For a comparison, the average number of hours exchanged in an American time bank is 5,308.949. The average number of members for American time-banks is 49. Counties on average host one Time bank with an exception of District of Columbia where 9 time banks co-exist.

Economic characteristics of selected counties are the following: Clarke county Georgia with the highest poverty level in the U.S. of 39.5 percent accommodates the high percentage of individuals with material deprivation; in contrast the American average is 13.6 percent. In regards to the issue of inequality, the average portion of individuals under the poverty level is 14.1, which is higher than the percentage of rich individuals, 7.38 percent on average. On average the richest families earn a 15.55 times higher income than the poorest ones. The highest inequality takes place in Orleans Parish County Louisiana where the richest acquire a 39.05 times higher income than the poorest ones. The next section concerns the discussion of the regression models' outcome.

4. DISCUSSION OF THE RESULTS

The outcome of the regression model is displayed on the Table 2 in the Appendix. Regarding diagnostic tests, according to Goldfeld-Quandt test and Harrison-McCabe test there is no evidence of heteroskedasticity of the error term. No strong correlation between predictor variables is present according to the Variance Inflation Factor test and no autocorrelation is detected following the Durbin-Watson test. The statistical significance of individual variables does not differ regardless which poverty or income variable enters the equation indicating a robustness of the core model.

The description of the resulting coefficients along with the explanation behind their size follows. The circulation appears as the first strongly statistically significant variable at the 1 percent level. Following my intuition, the longer a Time bank is in operation, the more hours are exchanged. Variable Population is not statistically significant therefore excluded from the model. Insignificance of the Population Indicator is in accordance with the study of Collom (2005).

4.1 Poverty variables

This is one of the most interesting results concerning poverty variables. All poverty variables appear as statistically significant in the model. In detail, the poverty variables of interest are the variable "Poverty" denoting impoverished individuals, "PovertyFam" indicating families living in poverty, the variable impoverished families is composed of married couples "Poverty Married," and the variable standing for the families in poverty consisting of members under 18 years old with children less than 18 years old denoted as "PovertyYoung".

While all these poverty indicators are statistically significant, in accordance with the study of Collom (2005), they negatively affect the number of hours exchanged. In comparison, the result of the model indicates the unemployment rate as a favourable factor for influencing the number of exchanged hours as other studies suggest (see Collom, 2005). Poverty though does not equal unemployment; in fact, individuals who fall below the poverty level can belong to the working class. The correlation coefficient between unemployment rate and poverty is interestingly low 0.478.

At present, the developed capitalist society of the United States faces an increase in individuals living below the poverty line. The young generation is for the first time less educated and poorer than their parents (Becker, 2010) Chain stores benefit from stronger bargaining power on the labour market with numerous unskilled workers. Employees in turn earn lower salaries for a longer workweek. This scenario, to an extreme, happened during the neoliberalization of New Zealand called "working poverty". In 2004 most members of poor families worked long hours while still staying below the poverty line. According to North (2007, p. 146) this group of impoverished individuals had little time to participate in the alternative currency movement "Green Dollars". Participants frequently exchanging the local currency were not those viewing it as a survival mechanism (North, 2007, p. 147). Following this pattern, unskilled, impoverished but employed individuals might lack the time to search or benefit from alternatives such as time banking.

Analysing the composition of membership in a Time bank in the UK by Seyfang (2002, 2003) signals those most active as being unemployed, socially excluded, commonly retired or those having long-term disability or limiting sickness. These individuals all have a sufficient amount of time to spend on participation in time banking.

Time banking schemes demand time in hours as those are what enter the transaction. Without time, individuals with low income can hardly offer their skills on this alternative market. North (2007, p. 120) finds a similar result for a local currency, Kor in Hungary, where the lack of membership was apparently caused by the long-hour workweek resulting in deficiency of time for participation. The study of Shaefer & Edin (2013) also supports this explanation by noticing the growth of extreme poverty in the United States along with an unexpected rise in the share of single mothers joining the workforce during the same time period. Collom (2007, p. 42) sees the lack of free time as the most common limitation to active participation in time bank exchanges among members. Similarly, Collom (2012, p. 185) identifies "being too busy" as the most frequently mentioned limitation of Hour Exchange Portland members. Collom (2012) also finds a lower give-to-receive ratio for employed participants. Working activists with a lack of time offer fewer G & S. Work obligations are reported as an important preventive factor for the attendance of time bank social events (Collom, 2007, p. 42). For employed individuals living with a lack of financial support, time might be too valuable a good to engage in time banking. Finally, Williams (1996b) reveals a similar tendency for the system LETS where low-income members seem to provide lower number of services than high-income members.

The book of North (2010, p. 89) provides additional possible explanation for such regression outcome. That is, the balance of an account denominated in a time bank can stay negative. For example, according to Collom (2012, p. 114) about 18 per cent of Hour Exchange Portland members and 17 per cent of Community Exchange members have held some debt. Participants might buy more services than they offer. This fact gives low-income classes an

opportunity to take advantage of time banking without offering their own skills. Unskilled poor people or people without time to sell their services might benefit from such a concept. The result is that the numbers of hours exchanged could appear considerably smaller in the presence of poor individuals whose demand exceeds supply than in counties where individuals offer the same amount of services as they demand.

In summary, a high concentration of those in need; poor young families with little kids in potential demand for babysitting or poor elderly individuals, do not seem to necessitate hourly exchanges. Poor Families variable standing for families with income below twenty-five thousand dollars reflects this pattern as well. The more impoverished individuals or families, the less number of exchanges within a time bank take place.

4.2 Wealthy families

Oppositely, the variable Wealthy Families is statistically significant at the 1 percent level with a positive sign. In contrast, the study of Collom (2012) finds a lower number of exchanged hours for employed members of the Community Exchange time bank in the United States. The Rich Families variable in turn affects the sign of the Income variable. The interpretation behind the positive causality leading from Wealthy Families to Exchanged Hours follows the one for Poor Families in an opposite manner.

The well-educated (see Carnero et al., 2015) high-income class of individuals, making over two hundred thousand dollars, can take advantage of having sufficient resources to substitute working hours for those spent by engagement in social cooperation, building social capital and helping their community. Rich people with that level of income might represent owners or managers of companies, those in charge of decision-making processes, considering the support of an alternative currency movement in their community. A higher proportion of rich individuals increase the probability that some owners of prospering companies are going to support or accept exchanges in a time-bank currency. The more there are managers and owners in a county, the higher chance for the success of a time-bank currency. A boost in time dollar exchanging is more likely once the owners of stores agree upon the acceptance of a local currency. This pattern is supported by the significance of the Retail-trade variable.

4.3 Retail-Trade variable

In search of the industry-composition of a county contributing to the success of a time-banking scheme, I have tested different industry-types ranging from agriculture, forestry, hunting, mining and fishing, construction, manufacturing, wholesale trade, retail trade, transportation and warehousing and utilities, information, finance, insurance and real estate and rental and leasing, professional scientific services and management, administration and waste management, education, health care and social assistance, arts, public administration and other services. Retail-trade appears as the only statistically significant variable from this set. More pervasive retail trade in respect to other types of industries indicates more traded hours in a county.

The use of time dollars in exchange for G&S does not have to necessarily occur on a person-to-person level (Dittmer, 2013, p.7). Agencies are often participants in these systems as well. Local stores benefit from accepting time dollars as a means of exchanging produced local G&S such as for example the ARROYO S.E.CO network (see www.asntb.com). The Tucson Time Traders website also contains information about the engagement of local businesses into the transaction of services as repair, carpentry or plumbing (timetraders.metasofa.org). Similar services are part of exchanges with the Dane time bank (assets.danecountytimebank.org) In a community with a higher concentration of retail trade, individual businesses might find more partnered companies for mutual cooperation with time banks as well as individuals finding more opportunities for their earned alternative currency.

The trading of these small-scale services provides the evidence behind the significance of the retail-trade variable. Seyfang (2006) contributes to this idea by noting American local businesses as donators of surplus goods and services to the participants in exchange for a time currency. Collom (2012), in studying three American time banks, records types of goods entering transactions. Entrepreneurial members commonly produce goods and sell them for time dollars and environmental organizations sell event tickets (Collom, 2012, p. 103).

The existence of a wide range of G&S providing for participants of a local currency movement is crucial for its success (See North, 2007). North (2007, p. 143) views a limited number of retail traders accepting an alternative currency, “Green Dollars” in New Zealand as the biggest obstacle to its proliferation. Seyfang (2003) identifies a

deficiency of skill-provision attractive to members of a UK time-bank as a burden for exchanges of time dollars. Collom (2007, p. 42) finds a better variety of services as the most frequent desire for time bank members. The absence of market goods and services denominated in time dollars commonly results in the failure of the currencies. This case the study supports the importance of retail trade for a time-banking scheme to become successful.

4.4 Income inequality

The inequality variable is statistically significant at the five percent level. Although theories suggest a positive effect of inequality on the demand for time dollars, the evidence proves otherwise. An increase in inequality tends to reduce the number of hours exchanged. The negative sign of the coefficient for the Inequality variable might originate in the negative effect of the Poverty variable. About 100 million people in the United States, one in three Americans, either live in poverty or barely above the poverty level (Federal register cited in Lietaer & Dunne, 2013, p. 12). If higher inequality means deepening poverty for low-income classes relative to the income growth of rich individuals, the resulting sign becomes consistent with this explanation. To accept/reject this hypothesis, the growth of individual values for the nominator has been compared to the drop of values in the denominator when the inequality variable rises. The outcome of this simple mathematic operation concludes in favour of a faster decrease of the denominator in respect to the increase of the nominator, which supports my hypothesis.

Finally, the composition of the Income Inequality variable depends on the income dispersion for families. The display of the regression results indicate a higher response of hours exchanged to increase of the portion of families with income below ten thousand dollars relative to those above two hundred thousand dollars. This could explain why the Exchanged Hours variable is responsive to the inequality variable in a similar pattern as with Poor Families.

4.5 Social security variable

The result of the Social Security variable corresponds to the theory. This variable reveals to be statistically significant. Disabled, not working or retired individuals seem to improve the participation score of Time banks. This outcome is in accordance with the previous literature. Time banks have been initiated to help marginalized, elderly or otherwise disabled groups. Social Security is an instrumental variable for these socially excluded groups and retired individuals receiving social benefits. It is also important to note the difference between this variable and the Poverty one. In fact, the correlation between these two is very weak, 0.135. The main difference is that individuals on social security might enjoy more free time to participate than impoverished ones as the first ones are commonly unemployed or retired. The correlation between individuals with social security and retired ones is 68 per cent.

4.6 Unemployment

In a similar fashion, unemployment rate is a significant statistical variable at the 1 percent level. This outcome corresponds to Carnero et al. (2015). Time banking creates a new opportunity for unemployed individuals to offer their skills and goods. In respect to the poverty rate, unemployed individuals or those who are disabled might benefit from more free time to join a time-bank. Similarly, an alternative currency like “Green Dollars” helped individuals to get work, obtain experience and create networks (North, 2007, p. 145).

This enumeration of significant factors is not conclusive; they rather represent economic characteristics. Seyfang (2006) for example identifies the policy context as a crucial environment for the success of Time banks.

5. CONCLUSION

Time banks have been designed to help marginalized, elderly, impoverished, and unemployed individuals with the intention of creating a more equal society. This paper starts by hypothesizing the portion of material deprivation, retail-trade industry, joblessness, disabilities and inequality in a community representing significant factors affecting the number of hours exchanged. The findings of the cross-sectional regression analysis affirm the significance of these variables.

The outcome indicates a higher proportion of unemployed individuals and those receiving social security benefits to serve as a positive characteristic boosting the number of hours exchanged. This result corresponds to previous literature on this topic. Retail trade has also positive effect on the number of hours exchanged.

On the other hand, higher portion of impoverished individuals as well as more sizable inequality in a county show to negatively affect the number of exchanges in a community. This finding is in discrepancy with the original hypothesis. Poverty and inequality do not seem to contribute to the success of a scheme but rather the opposite. The higher the gap between poor and rich in a county, the lower the amount of exchanged hours in a county. The concentration of poor individuals results in a lower number of exchanges between time bank members as well.

Participants need to possess spare time to engage in exchanges of time. Impoverished but full-time working members commonly lack such luxury. Next, Poor activists might benefit from demanding more goods and services than supplying them regardless their negative time-bank balances. These factors negatively affect the final number of hours exchanged. Conversely, the higher percentage of rich individuals, as well as increase in per capita income in a county, results in an improvement of the number of exchanges measured in hours.

Policy-maker, who inspects a place to launch a Time bank project, should examine the structure of population ahead of time. Community with a high concentration of low-income class does not guarantee a success in terms of number of exchanges. While this group of people might be in need of an alternative market to buy G&S, it can lack time and skills to offer demanded G&S in return.

Managers of a time bank might still decide to help low-income members. Then a sufficient amount of higher-income members or individuals with more time to actively participate, such as those receiving social security or those who are unemployed, could compensate for the negative balance or lack of transactions among impoverished families. A strong retail-trade industry may then secure a good variety of products or services which individuals might enjoy in exchange for hours.

It is necessary to note the sensitivity of this analysis to the assumption about the number of exchanges in hours to represent the right determinant of a time bank's success from the standpoint of time-banking organizers. If the aim of time banks is to maximize the number of membership regardless the number of hours exchanged, then the strategy would certainly differ.

This study also assumes territorial similarity of the counties and the size of the circulation of individual time banks. An additional study could support the outcome with findings from the analysis of the link between the socio-economic variables evolving in neighbourhoods more closely approximating the geographic areas where these time banks operate.

Subsequent research could provide an insight from individual time banks explaining the negative sign for Poverty, Poor Families and Inequality variables, as well as draw on more extensive policy implications. Cross-sectional analysis applied in this study is a rather limited empirical tool. A panel-data model could be another more advanced tool for supporting the conclusion of this model.

APPENDIX

Description of individual variables:

ExHours: To obtain average number of hours exchanged in a county, the number of exchanged hours as presented on the Community time banks website is divided by the number of Time banks operating in a county.

Circulation: The average of years time-banking schemes in a county have been in operation.

Population: Population of a county.

Unempl: This variable stands for the percentage of the unemployed civilian labour force in a county.

Retail-trade: This variable corresponds to the percentage of civilian employed population with an age 16 and over in the industry of retail trade in a county.

Poverty variables:

Poverty: Percentage of families and people whose income in the past 12 months was below the poverty level in a county.

PovertyFam: Percentage of families whose income in the past 12 months was below the poverty level in a county.

Poverty Young: Percentage of families under 18 years with related children under 18 years old whose income in the past 12 months was below the poverty level in a county.

Poverty Married: Percentage of families composed of married couples whose income in the past 12 months was below the poverty level in a county.

Income variables:

Poor Families: The value of this variable reflects the percentage of families with income and benefits below twenty five thousand dollars calculated in a county in 2014 inflation-adjusted dollars.

Wealthy Families: This variable stands for the percentage of families with income and benefits above two hundred thousand dollars calculated in a county in 2014 inflation-adjusted dollars.

Income: Per capita income in logarithmic form in a county in 2014 inflation-adjusted dollars.

Inequality: Variable Inequality between families' income in a county was computed following the Decile dispersion ratio with income values collected from the American community survey (For Decile dispersion ratio see http://web.worldbank.org/). To follow the computation of this ratio I have divided the average income of the ten per cent families with the highest income by the average income of the ten per cent families with the lowest income. The advantage of this ratio is its easy interpretation expressing the income of rich as multiple of that of poor.

SocSecurity: Percentage of incomes consisting of social security calculated in 2014 inflation-adjusted dollars in a county.

Table 1: Summary statistics

	MIN	MEDIAN	MEAN	MAX
Circulation	0.00	0.00	1.53	10.00
Unempl	3.10	6.65	6.91	12.80
SocSecurity	16.10	31.30	31.47	61.60
Retail-trade	4.90	11.30	11.55	17.50
Poverty	4.10	13.60	14.10	39.50
PovertyFam	2.70	9.40	9.94	29.10
PovertyYoung	4.20	19.15	19.08	44.10
Poverty Married	0.70	4.10	4.73	15.80
Rich Families	0.80	5.80	7.38	26.80
Poor Families	3.92	13.60	14.04	35.65
Income	9.76	10.25	10.29	11.08
Inequality	9.79	15.55	16.73	39.05
ExHours	0.00	7.00	37.66	838.00
Exchanged Hours	0.00	0.00	5,308.95	1,000,535.00

Table 2: Results

(Intercept)	**-19,136.76**	**-31,065.50**	**-20,217.23**	**-16,279.80**	**-19,777.69**	**-20,536.14**	**-20,594.91**	**-1,087,676.44**
	(-4.724)***	(-5.908)***	(-5.042)***	(-3.752)***	(-4.918)***	(-5.137)***	(-5.147)***	(-3.601)***
Circulation	1,993.58	1,993.21	1,985.14	1,867.40	1,966.38	1,964.10	1,954.68	1,967.95
	(7.532)***	(7.552)***	(7.478)***	(7.073)***	(7.423)***	(7.402)***	(7.357)***	(7.468)***
Unempl	992.34	697.00	947.76	905.60	1,050.40	975.84	902.10	821.33
	(3.227)***	(2.641)***	(3.070)**	(3.016)***	(3.220)***	(3.094)***	(2.980)***	(2.995)***
SocSecurity	178.02	293.07	218.68		190.86	222.64	181.59	255.77
	(1.925)*	(3.133)***	(2.401)***		(2.076)**	(2.446)**	(1.948)*	(2.810)***
Retail-trade	833.95	1,146.05	799.81	1,081.20	776.55	768.44	861.76	1,122.39
	(2.322)**	(3.006)***	(2.224)**	(3.381)***	(2.164)**	(2.138)**	(2.378)**	(2.976)***
Poverty	-309.56							
	(-2.634)***							
PovertyFam					-384.95			
					(-2.496)**			
PovertyYoung						-180.96		
						(-2.344)**		
Poverty Married							-562.07	
							(-2.235)**	
Rich Families		321.24						
		(2.857)***						
Poor Families			-274.39					
			(-2.347)**					
Income								7,843.04
								(2.924)***
Inequality				-219.80				
				(-2.001)**				
Obs.	221	221	221	221	221	221	221	221
R^2	0.2779	0.2818	0.2732	0.2478	0.2646	0.2731	0.2715	0.2831

Notes: t-value in parenthesis. p-value < 0.1 *, 0.5 **, 0.01 ***

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