

Research on Time Bank Mutual Pension Model under the Background of Aging Population

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Abstract: With the aging of the population, the age security of low-income urban and rural residents, who account for about 70% of China's total population, has become an important issue related to the national economy and people's livelihood, and also a short board to be solved urgently in building a socialist modernization power^[1]. Mutual support for the aged is a new pension model that transcends the blood relationship, can assist the family to provide for the aged, and solve the pension problem with the help of social forces. In this model, the concept of "time money" is introduced and merged into a brand-new mutual support model "Time Bank". China's "Time Bank" mechanism is still in the development stage, and there are still some problems from the current operation of this new pension model in China. In order to promote the extensive development of Time Bank, this paper makes a theoretical analysis on the conversion of time currency value, withdrawal and deposit, the conversion of labor value and time currency value in Time Bank, and the inheritance of time currency savings, so as to create an all-round, wide-area, multi-level and integrated old-age service ecology, create a service-oriented old-age model with China characteristics, and contribute to China's wisdom and China's plan for solving the world's old-age problems.

Keywords: Time Bank, Mutual support for the aged.

1. Introduction

China's seventh census in 2020 showed that there were 88.11 million people over the age of 65, accounting for 6.96% of the total population. The sample survey in 2020 showed that the proportion of people over the age of 65 rose to 82%, and the survey at the end of 2005 showed that the number of elderly people in China had reached 100.55 million, accounting for 7.7% of the total population. According to the standards set by the United Nations, people over the age of 65 accounted for the total^[2]. With the passage of time, the aging of the population is becoming more and more serious. Therefore, it is necessary to implement the mutual pension model, among which the most developed one is the Time Bank, which is a practice form expanded according to the idea of self-care and mutual pension. The mutual pension model of Time Bank encourages and guides volunteers to provide pension services for the elderly according to the idea of "saving time at the younger age, exchanging services at the older age", and records the storage service time according to certain rules. Time Bank is an important operation mechanism of mutual support for the aged in China. The operation idea of Time Bank is to transform the traditional asymmetric social

service mode into social network, make up for the scarcity of personal resources with the abundant advantages of network resources, build a community ecology with time as universal equivalent by improving the lack of interaction between people in modern society, and use it to develop a new mode of mutual support for the aged and gather social capital to ease the pressure of future aged care. Therefore, it is necessary to further explore the concept and practice of developing Time Bank to solve the problem of old-age care.

2. The Background and Present Situation of the Development of Time Bank in China

With the acceleration of the aging process, the number of elderly people in China is increasing, and providing for the aged has become a big practical problem at present. According to the data released by the National Bureau of Statistics in January, 2018, by the end of 2017, the population over 60 years old in China had reached 240.9 million, accounting for about 17.3% of the total population, of which 158.31 million were over 65 years old, accounting for 11.4% of the total population. As shown in Table 1[3]:

Table 1. Population and composition in 2017

index	Year-end number (10,000 people)	Specific gravity(%)
National population	139008	100.0
Among them: town	81347	58.52
Countryside	57661	41.48
Among them: male	71137	51.2
woman	67871	48.8
Among them: 0-15 years old (including under 16 years old)	24719	17.8
16-59 years old (including under 60 years old)	90199	64.9
60 years old and above	24090	17.3
Among them: 65 years old and above.	15831	11.4

The problem of providing for the aged has become a social issue of great concern, and topics such as "empty nesters" and "lonely elderly" are still hot. At present, the problem of providing for the aged in China is serious, and the reasons are as follows:

1.Changes of children's concept of old-age care

A large number of people no longer regard caring for their parents as their primary responsibility, and even some people refuse to raise their parents. China's traditional virtue of respecting the elderly has been weakened, while the rapid economic development and the improvement of living standards have provided conditions for children to move out and live together. On the other hand, with the popularization of education, the number of people who leave their parents to study abroad is increasing. There are more and more empty nest families with only parents. At the same time, due to the fast pace of modern life and the pressure of work, children take less and less care of their parents.

2.Poverty in old age

At present, poverty has become one of the basic problems in China society, and the government attaches great importance to it. With the process of reform and opening up, planned economy has been replaced by market economy. The employment situation has become very severe, which leads to employment difficulties for the elderly. Because almost no one in this generation enjoys old-age insurance, they can only rely on retirement pension to maintain their own life. However, with the deepening and development of economic reform, the competition among enterprises has become more intense, resulting in enterprises defaulting on their pensions due to the economic crisis. The economic income of the elderly is not guaranteed .

3.The social welfare system is not perfect.

With the increasingly serious problem of providing for the elderly, more and more elderly people want to enter welfare institutions. However, the welfare homes for the elderly in China are far from meeting the needs of the elderly. According to the survey, there are about 10 million elderly people over 70 years old in China, but there are less than 40,000 welfare institutions in China, which can only accommodate more than 830,000 people. Among the existing welfare institutions. In China, many welfare institutions are facing the dilemma of lack of funds at the same time.The imperfect medical welfare of the elderly is also one of the problems in our welfare system. The reform and opening-up drive China's economic development, and at the same time, it also increases the cost of medical treatment and medicines. As a result, many elderly people don't look down on diseases, and some minor diseases don't go to see them. In this case, the state has not introduced policies to reduce the medical expenses of the elderly to ensure their health.

Therefore, this requires the mode of "self-support for the aged" to solve the aging problem and the severe support for the aged, and "Time Bank" is one of its concrete forms. From the national point of view, according to statistics, at present, there are more than 240 Time Banking institutions in China, covering 31 provinces (municipalities and autonomous regions), such as Sichuan Chengdu, Jiangsu Nanjing, Guangdong Guangzhou, Anhui Huangshan, Shandong Binzhou and Hangzhou, Zhejiang, etc., which have developed time-based mutual support for the aged. For example, time-based bank in Laojie Community of Huangshan City, Anhui Province has attracted more elderly groups in this community

to participate. This domestic model mainly serves the elderly and the disabled in the community, with the younger and health of the elderly as the main service providers, and provides daily care and spiritual comfort as the main service contents. However, the organization, management and operation of this model in China have not yet formed a mature system, and there are still many shortcomings, such as imperfect organization and management mechanism, less funding sources, imperfect network information system, and insufficient development efforts. Take Beijing as an example. In 2022, the Beijing Municipal Government took the development of the "Time Bank" mutual assistance and old-age care model as a clear task for the municipal government for the first time. Services for the aged include emotional comfort, assistance services, travel company, cultural and sports activities, health science popularization, legal aid, training lectures, guidance to prevent financial and network risks, etc. Each district will optimize the service content of Time Bank according to the actual situation of the elderly in the district, the professional characteristics and distribution of volunteers, etc., and launch service items that meet the personalized service needs and are grounded[4].

3. The Development of Foreign Time Banks

Time Bank has a mature system abroad. The "Time Bank" model was first put into practice in the United States, and developed rapidly in constant practice. The original design idea of this model is mutual help between the elderly, with the aim of improving the quality of old-age care. With the continuous development of banks, the participants have been extended to young people. The two most representative concrete practices of American Time Bank: the Older Volunteer Service Bank and the Elderplan. In Britain, former Prime Minister Blair highly praised the mutual aid model of Time Bank. At present, there are 108 Time Banks in the UK with about 20,000 participants. There are two most representative Time Banks in Britain: StonehouseFair Shares and RusheyGreen Time Bank. For Japan, the aging phenomenon is very serious, and the government has a heavy burden of providing for the aged. Therefore, as an effective method to solve the problem of providing for the aged, the Time Bank model has been well developed in Japan. There are two most representative Time Banks in Japan: Volunteer LabourNetwork (VLN) and Japan Active Life Club (NALC). The currency in Japan Time Bank can be converted into real currency, that is, it can "buy" time with money and pay at 500 yen/hour. Secondly, Japan's active life club also has obvious organizational structure advantages and professional coordinators. As it acts as a link in the whole organization, Japan's active life club will focus on training them and give them relevant professional training to better serve the organization. Up to now, the organization has more than 100 branches and more than 26,500 members, which has initially completed the realization of mutual benefit and assistance in people's lives by Time Bank[5].

4. The Theoretical Basis and Research Model are put forward

Time Bank is developed from the complementary monetary system-"Time Dollar" put forward by American economist Edgar S. Cahn, which advocates the replacement of time

equivalence with simple mathematical logic[6]. Foreign scholars unanimously agree that the Time Bank deposit interest formula refers to the money deposit interest formula: deposit interest = deposit principal × deposit interest rate × deposit term, and it is concluded that time interest = deposit principal × deposit interest rate × deposit term. At present, all the "Time Banks" established at home and abroad for mutual assistance and old-age care record the service time and service types, without taking labor intensity and labor value into account. After all, "Time Bank" is a carrier of exchange, and the basic principle of exchange under the condition of market economy is fairness. From the perspective of rational economic man, different labors in the same time have different intensities and technical contents, and labors with different intensities and technical contents obviously have different values, so it is unfair to measure them only by time. At home and abroad, the system of Time Banks exchanging money for time currency is relatively simple, only a simple conversion formula of time unit and currency unit, in which the parameters are not comprehensive and targeted. Our team will investigate, adjust and calculate the conversion parameters according to the economic development of each region, and adjust and improve the conversion parameters of time currency and money currency according to the service market economy. The economic level of each region is different, especially the economic gap between poverty-stricken areas and developed areas is relatively large, and there are different conversion parameters for different economic regions; The service intensity varies with the service intensity, so there are different conversion parameters for different service intensities. This paper makes an empirical analysis of the conversion parameters from three possible influencing factors: regional economic level, personal economic level and service intensity, so as to promote the balanced relationship between Time Bank and service market. Therefore, we set up a multiple regression model to analyze the conversion of time equation.

5. Empirical Test and Analysis

To investigate the basic situation of users of Time Banks in various parts of China, we designed the questionnaire "Survey of Users of Time Banks in China: Taking 20 Regions as an Example", randomly selected 20 regions in China, and conducted a questionnaire survey in these 20 regions. Our questionnaire started in April 2021, and as of October 2022, we got 257 questionnaires, of which 243 were valid. There are 21 questions in the questionnaire, including about 46 information items. According to this questionnaire, the following information about users is finally obtained: the money spent by users of Time Bank, the service time obtained by users, the assets of users served, the economic score of users' region and the service intensity level (divided into 1, 2 and 3 grades)^[7].

Combined with the factors influencing time and currency conversion, this paper establishes multiple regression analysis on time and currency conversion according to five indicators: the money spent by domestic Time Bank users, the service time obtained by users, the assets served by users, the economic score of the user's region and the service intensity level from 2021 to 2022. Here, the amount of deposit consumption acquired by users when they exchange deposits is selected as the time and currency conversion index.

$$Y = b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + e + C$$

Y means the money spent by the user (yuan).

X₁ indicates the service time (h) obtained by the user.

X₂ indicates the assets of the served users (ten thousand yuan).

X₃ indicates the economic GDP score of the user's region (tens of billions).

X₄ indicates the service intensity level (grade).

C is a constant term, b₁~b₄ is an independent variable coefficient, and Y is self-explanatory.

Regression coefficients of variables X₁~X₄, and e is the residual error.

The values of users in each region are averaged and included in Table 2.

Table 2. Regional Questionnaire

region	Y	X ₁	X ₂	X ₃	X ₄
Shanghai	21	0.5	40	387	1
Beijing	35.5	1	5	361.02	2
Shenzhen	71	2	16.5	276.7	3
Guangzhou	77	3	16.3	250.19	1
Chongqing	119	4	60	250.02	2
Suzhou	171	5	100.1	201.7	3
Chengdu	150	6	9.7	177.16	1
Hangzhou	200	7	2.3	161.06	2
Wuhan	260.5	8	39	156.22	3
Nanjing	220	9	13.6	148.17	1
Tianjin	17	0.5	2.9	140.83	2
Ningbo	34	1	4.86	124.08	3
Qingdao	52	2	23	124	1
Wuxi	88	3	28	123.7	2
Changsha	134	4	61	121.42	3
Zhengzhou	124	5	29.2	120.03	1
Foshan	171	6	10.1	108.16	2
Quanzhou	231	7	98.8	101.58	3
Jinan	195	8	22.7	101.4	1
Hefei	254.5	9	14	100.45	2

First, pay attention to the correlation between independent

variables. In the result output table 3, it shows that the

correlation coefficients between all independent variables are all < 0.6, and the P values are all > 0.05, so the possibility of

multicollinearity among independent variables is small.

Table 3. Correlation table

		X ₁	X ₂	X ₃	X ₄
X ₁	Pearson correlation	1	.141	-.530	-.043
	Remarkable (bilateral)		.552	.016	.856
X ₂	Pearson correlation	.141	1	-.024	.426
	Remarkable (bilateral)	.552		.920	.061
X ₃	Pearson correlation	-.530	-.024	1	-.112
	Remarkable (bilateral)	.016	.920		.640
X ₄	Pearson correlation	-.043	.426	-.112	1
	Remarkable (bilateral)	.856	.061	.640	

Secondly, two statistics of collinearity diagnosis are shown in Table 4: Tolerance and VIF (variance expansion factor). As shown in the table, tolerance is > 0.7, and VIF is < 2.

Therefore, the possibility of multicollinearity among independent variables is small.

Table 4. Coefficient table

model		Non-standardized coefficient		Standard coefficient	t	Sig.	Collinearity statistics	
		B	Standard error	Trial version			allowance	VIF
1	(constant)	8.314	8.136		1.022	.320		
	X ₁	27.024	1.523	.973	17.741	.000	1.000	1.000
2	(constant)	-29.951	7.301		-4.103	.001		
	X ₁	27.262	.831	.981	32.793	.000	.998	1.002
	X ₄	19.068	2.890	.197	6.599	.000	.998	1.002
3	(constant)	-28.367	6.268		-4.526	.000		
	X ₁	26.918	.722	.969	37.282	.000	.967	1.034
	X ₄	15.831	2.746	.164	5.764	.000	.807	1.239
	X ₂	.211	.078	.077	2.696	.016	.793	1.262

Dependent variable: y

Finally, pay attention to two parameters in the collinearity diagnosis table 5: eigenvalue and conditional index. As shown in the table, all the eigenvalues are not equal to 0, and all the

conditional indexes are < 8, so it is less likely that there is multicollinearity among independent variables.

Table 5. Collinearity diagnosis

model	dimension	eigenvalue	Conditional index	Variance ratio			
				(constant)	X ₁	X ₂	X ₃
1	1	1.852	1.000	.07	.07		
	2	.148	3.536	.93	.93		
2	1	2.705	1.000	.01	.03	.02	
	2	.232	3.417	.02	.75	.20	
	3	.064	6.523	.97	.22	.78	
3	1	3.369	1.000	.01	.02	.01	.02
	2	.360	3.060	.02	.19	.00	.70
	3	.213	3.980	.06	.57	.18	.17
	4	.058	7.594	.91	.23	.81	.10

Dependent variable: y

The KMO value of the model =0.287 is low, so it is not suitable for factor analysis. To sum up, a conclusion can be drawn: there is no multicollinearity among independent

variables, which will not affect the accuracy and reliability of the research model, and it is suitable for regression analysis.

Durbin-Watson test results are shown in Table 6.

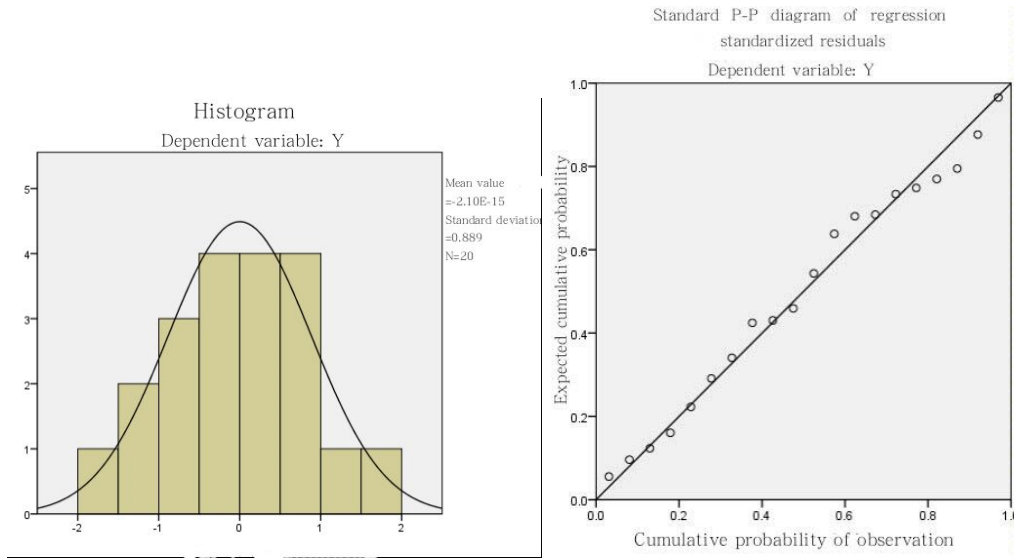
Table 6. Summary of model

model	R	R square	Adjust r square	Error of standard estimation	Durbin-Watson
1	.995a	.991	.988	8.66892	2.652

A. Predicted variables: (constant), X₄, X₁, X₂, X₃.
 B. Dependent variable: y

Durbin-Wh other. In this study, the observed values are independent of each other. In fact, whether the observations are independent of each other is related to the design of this

study. If the researchers aratson test value of this study is 2.652.



As can be seen from the Histogram, the standardized residual error of this regression is approximately normal distribution, but due to the influence of abscissa ratio, the result of histogram may be inaccurate, so we need to draw a normal P-P diagram for further verification.

normality of data, with good accuracy. The closer the distribution of each point of the normal P-P diagram is to the diagonal line, the closer the data is to the normal distribution; If each point just falls on the diagonal, then the data is a normal distribution.

Normal P-P diagram is a special tool for testing the

For inspection results ANOVA Table 7:

Table 7. Anova

model	Sum of squares	df	mean square	F	Sig.
Return	119665.986	4	29916.497	398.090	.000b
Residual	1127.251	15	75.150		
amount to	120793.238	19			

A. dependent variable: y

B. Predicted variables: (constant), X₄, X₁, X₂, X₃.

The results show that, P<0.001, the regression model of this study has statistical significance, and there is a linear correlation between dependent variables and independent variables. If P>0.05, it means that the regression has no statistical significance, and there is no linear correlation between the dependent variable and the independent variable.

The regression equation of this study is expressed as:

$$Y = b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + C$$

C is the intercept constant, and b₁-b₄ is the regression coefficient. See Table 8 for coefficient analysis of intercept constant and slope.

Table 8. Coefficient

model	Non-standardized coefficient		Standard coefficient	t	Sig	95.0% confidence interval of B	
	B	standard error	trial version			lower limit	upper limit
(constant)	-38.868	9.954		-3.905	.001	-60.085	-17.651
X ₁	27.542	.845	.991	32.585	.000	25.740	29.343
X ₂	.196	.077	.072	2.536	.023	.031	.360
X ₃	.038	.028	.040	1.337	.201	-.022	.097
X ₄	16.587	2.740	.172	6.054	.000	10.747	22.428

dependent variable: y

It can be seen from the figure that the p value of X_3 ($p = 0.201$) is greater than 0.05, and X_3 has little influence on this study (x_3 has only a slight influence on y , and only the product of its coefficient is substituted into the regression equation), and the p values of other factors are all less than 0.05, which has a great influence on this study. Because of this equation The upper and lower limits of the 95% confidence interval of the prediction are given in the chart above. Because of the

instability of the observed values, the prediction interval is often larger than the confidence interval. The coefficients and constants used for prediction are the average of the sum of the upper and lower limits, which can make the prediction more accurate. The final predictive regression equation is:

$$Y = 27.542x_1 + 0.196x_2 + 0.038x_3 + 16.587x_4 - 38.868$$

The significance of adjusted R² and F for regression model is shown in Table 9.

Table 9. Model Summary

model	R	R square	Adjust r square	Error of standard estimation	Change statistics				
					R change	F change	df1	df2	Sig. F changes
1	.995a	.991	.988	8.6689	.991	398.090	4	15	.000

Predicted variables: (constant), X_4 , X_1 , X_2 , X_3 .

The adjusted R²=0.988 in the table indicates that the fitting degree of the fitting equation is very high, and the P value < 0.05 indicates that the regression model is effective.

In the final regression equation, it can be seen that the coefficients of X_1 and X_4 are large, and they have great influence on Y , while the coefficients of X_2 and X_3 are small, and their influence on Y is small. Every time X_1 increases for 1 hour, Y will increase by 27.542 yuan; Every time X_2 increases by 10,000 yuan, Y will increase by 0.196 yuan; Every time X_3 increases by 10 billion yuan, Y will increase by 0.038 yuan; Every time X_4 increases by one difficulty level, Y increases by 16.587 yuan. Actually, the bases and variations of X_1 and X_4 are relatively small, and the product of X_3 and X_4 has a relatively high influence on y , while the products of x_3 and x_4 have a large influence on y . This paper analyzes the factors that affect the currency exchange between money and time currency from four aspects, and all of them have the same influence. Because the parameter in the quasi-prediction equation is negative, that is, -38.868, the price of a short service time is lower than that of a continuous long service time. In this study, the predicted Time Bank conversion equation is obtained, which can be used as a research project for reference by Time Banks in various places.

6. Problems and Countermeasures of China Time Bank's Mutual Pension Mode

1. Insufficient awareness of the masses

The government's policy propaganda is insufficient or not in place, which is easy to cause the public's cognitive bias, and is not conducive to the development of volunteer service teams. The low social awareness greatly limits the enthusiasm and motivation of residents to participate in it, resulting in the insufficient number of participants, which has become one of the important constraints for the rapid development of Time Bank. Therefore, it is necessary to make joint efforts with the government to create a macro-environment conducive to development and expand the coverage. At present, Time Bank is in the development stage in China, and people in China don't know much about Time Bank, which requires the government to give full play to the role of publicity and supervision. The government should carry out the Time Bank nationwide, strengthen the publicity of the Time Bank mechanism among the people, make the Time Bank known and accepted by the public, and lay a solid mass foundation

for the next development.

2. Poor service team construction.

As far as the service team structure is concerned, the volunteer group providing services is relatively single, and most of them are enthusiastic about this service, but they lack volunteers with strong professional skills, so they can't provide the aged care services with professional skills. Therefore, it is necessary to clarify the public welfare of the Time Bank to the participants, strengthen the training and management of the mutual-aid aged care service groups participating in the Time Bank mechanism, build a scientific management system, and form a reasonable operation mode of the managers, service providers and service recipients in the Time Bank organization, and pay attention to providing service ability training to service providers, so as to better meet the diversified needs of different service demanders.

3. Sustainable development and restricted cross-regional exchange.

At present, population mobility is an important factor to be considered in solving the problem of old-age care services. The service supply and exchange of Time Banks are often continuous and the service exchange is immediate, which is faced with the regional exchange problem caused by population mobility. The management and measurement standards of different regions are different, so whether the unified standard of time storage can be realized, and whether this old-age care service mode of Time Banks can develop sustainably. Therefore, On the operation mechanism, Time Bank can learn from the operation mode of traditional money banks, establish a unified operation mechanism mode nationwide, implement a unified institutionalized and standardized management, and issue a unified time currency.

4. Lack of policies and regulations

If the guidance of policies and regulations, unified and standardized guidance, and strong public trust guarantee are absent for a long time, it will seriously hinder the sustainable and stable development of mutual assistance and aged care services. Therefore, it is very important to issue policies and laws that regulate Time Banks. It is necessary for the state to formulate special policies and laws for Time Banks according to their particularity, so as to promote the further sustainable and healthy development of mutual assistance and old-age care mode under the mechanism of "Time Banks". Among them, labor behavior is regulated by the Labor Law and the Labor Contract Law, and pension is regulated by the Social Insurance Law and the Law of the People's Republic of China

on the Protection of the Rights and Interests of the Elderly, so as to legalize and standardize the mutual assistance and pension service of Time Bank[8].

7. Conclusion

With the coming of an aging society, the problem of the elderly is becoming more and more serious, among which the problem of providing for the aged is particularly prominent, which is directly related to the life of the elderly. Therefore, the innovation of the old-age care model is particularly important, and the Time Bank mutual-aid old-age care model, as a supplement to the rural and community old-age care models, emphasizes the mutual comfort and assistance between the elderly. Under this old-age care model, the old people have the same language, similar customs, similar interests and get along harmoniously, which is conducive to strengthening the ties among members of society and building a harmonious society. However, the mutual pension mode of Time Bank is not perfect, and there are some problems, such as insufficient public awareness, weak service team construction, lack of policies and regulations, sustainable development and limited cross-regional exchange. Although some areas have begun to explore and practice, they have not formed a large scale in China.

In fact, the greatest significance of Time Bank is that it reflects the positive encouragement of the society to be upward and good. Morality needs to be motivated. A person who is enthusiastic about public welfare may not want anything from public welfare. To put it simply, we should not only understand those who take part in public service with an eye to the future pension, but also respect those who do public welfare simply for the sake of public welfare. At least in the original intention of the system, we can't distinguish the two, and we should prevent the association that brings utility to public welfare. Therefore, the significance of Time Bank is not only to provide for the aged, but also to be regarded as an innovative product of social governance[9]. Facts will prove that respecting and maintaining its public welfare color is more conducive to the promotion of Time Bank and the

improvement of pension measures.

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References

- [1] Haijian Li,Wenjie Li,Ran Li.Research on the future pension model of China-based on the expansion path of Time Bank [J]. Management World .2020.
- [2] National Bureau of Statistics. Statistical Bulletin of National Economic and Social Development of People's Republic of China (PRC) in 2017 [R]. China Statistics Publishing House. 2018.
- [3] Zichen Guan,Lei Rong,Yi Zhang.On the implementation the Beijing "Time Bank" program of exchanging volunteer hours for elderly care services [N].Beijing Business Today.2022.
- [4] Ming Li, Haijun Gao. The development of foreign Time Banks under the background of aging and its enlightenment to mutual support for the aged in China [J]. Foreign Social Sciences .2019.
- [5] Cahn ES.On LETS and Time Dollars [J].Int J Community Currency Res,2001,5(20):1-4.
- [6] Tongliang An,Hao Shi,Ludovico Alcorta.Observation and Demonstration of R&D Behavior Pattern of Chinese Manufacturing Enterprises--An Empirical Analysis Based on Questionnaire Survey of Manufacturing Enterprises in Jiangsu Province[J].Economic research.2006.P:22.
- [7] Siqin Li. On the Model of "Time Bank" Mutual Support for the Aged from the Perspective of Institutional Theory Development dilemma and optimization path [J].Society and Public Welfare.2021.P:75.
- [8] Jianguo Mao. Tianyan's commentary on world phenomena [N]. Tianyan News .2019.
- [9] Gong Chen,Xiaohan Wang.Research on the Problems and Countermeasures in the Operation of "Time Bank" Mutual Assistance for the Aged in China [J].Theoretical Journal.2020.P:132.