Senior Tourism Market Capacity Model in the Uncertain Market Environment

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Abstract
In order to find out how big on earth the capacity of the senior tourism market, firstly this paper listed and inducted all the elements involved in the tourism market and then made mathematical analysis on the connections among different elements. Of those elements, purchasing power is considered as a key one. So in order to minimize the effect of uncertainties during the process of building model, linear regression model and ARIMA model were built specifically to analyze and predict the purchasing power. Then based on analysis the senior tourism market capacity model was built. Finally, through the analysis and fitting of authoritative data, the predicative value of the gross senior tourism market capacity and different segment markets in the next five years was worked out.
Key words: SENIOR TOURISM MARKET, MARKET CAPACITY, ARIMA MODEL, MARKET SEGMENTATION

Introduction

As China is moving rapidly toward the aging society, a tourism market targeted at the elderly has attracted great attention due to its high profit. And this profitable cake is has become a great concern of thousands of tourism corporations and those agencies need to find out how big the profitable cake on earth to make new marketing strategies. Though, with the coming of global aging era, researches about tourism market for the aged have increased day by day at home and abroad, but researchers can't answer the question about how big the profitable cake on earth.

At present, these researches are mainly classified into two types. The first type is analyzing the consumption habit and behavior characteristics of the aged through social survey. The second is studying the population structure of the aged based on population model and making predication about related indexes.

Many scholars at home and abroad have made statistical analysis about the consumption habit and behavior characteristics of the aged. After studying the tourism behavior of the elderly, in 2014 Hyelin Kim, Eunju Woo and Muzaffer Uysal summarized that satisfaction with the leisure life and overall quality of life were two key factors that decided whether the elderly would like to visit a place again [1]. In 2009 N. Selma Özdipçiner studied the influences of age, job and education level on the old people's degree of satisfaction with the tourism through a survey involving 250 senior German tourists [2]. According to the situation of market competition, Zhang Qi found various influencing factors behind the universal competition, analyzed the territorial senior tourism market and got a detailed marketing strategy [3]. Yang Zhixiang put

forward a specific development strategy for senior tourism market based on the analysis of consumption characteristics of the elderly. Wen Lingfei came up with his unique opinion on the foundation of overall research about the marketing strategy in Guangzhou according to the investigation and analysis of Guangzhou and travel characteristics of the aged [4]. When interpreting the investigation data, Hu Pingsummarized the overall characteristics of tourism market for the aged in Shanghai, such as large quantity, increasing momentum, comfort ability and multi levels, as well as various consumption characteristics in terms of some certain travels and gave some relevant suggestions[5], etc.

When it comes to the research in the population structure and scale based on population model, many scholars have done this job. Joana Sniadek made a detailed analysis and summary about the challenge that senior tourism and leisure industry were facing [6]. He divided the old people into different age groups and analyzed their consumption characteristics and habits respectively. Bąk and Iwon took Poland as an example and made statistics and analysis about specific features of the traveling of the aged as well as opportunities and challenges that the population aging brought to the tourism market [7]. Anita Zichun Chu and Regina Juchun Chu analyzed the important role the attitudes of the aged played in predicting service willingness through structural equation model [8]. The research team of the Industry Research and Report, in 2013, predicted the operational situation and investment prospects of the senior tourism market. Zhu Qunying put forward strategies for developing the tourism market for the aged in China after analyzing the population structure and scale. Wang Shuang and Lv Yingxia made a research in depth about the current situation and existing problems of the tourism market for the elderly in China [9]. Cui Jia took the tourist-dedicated train "Xiyanghong" as an example, studied its operation by means of SWOT and corresponding marketing strategy [10], etc.

These researchers made great contribution in studying the senior tourism market. However, most researches were done by qualitative analysis instead of quantitative analysis based on professional data. As for this, the paper set up the senior tourism market capacity model based on authoritative data through data analysis and data-fitting. This paper listed and inducted all the elements involved in the tourism market and then made mathematical analysis on the connections among different elements. Of those elements, purchasing power is considered as a key one. With the help of some professional software like Eviews and SPSS, linear regression model and ARIMA model were built specifically to analyze and predict the purchasing power. Then based on the analysis the senior tourism market capacity model was built. It predicted the capacity of the tourism market for the aged in cities and towns as well as the capacity of various segment markets in next five years to provide decision basis for tourism enterprises in the future marketing practice.

Building the Senior Tourism Market Capacity Model

Generally speaking, the tourism market mechanism is a self-organizing and self-adjusting comprehensive function which is attributed to the interaction of all the market elements via their co-adaptations and mutual restrictions in the tourism market-oriented economy. The motive of this mechanism is that the tourism market subjects have the desire to pursue individual interests and it can be transformed to be the target of both tourism corporations and social economy, such as the tourism market information service, transportation as well as other services. Meanwhile the self-adjustment of tourism market is achieved under the law of value and the law of competition.

Taking a wide view of the tourism market exploration, to form or establish a mature tourism market, there are three main factors: population, purchasing power and travel desire. They have both connections and differences and the functional relation can be inducted as follows: Tourism Market=Population x Purchasing Power x Travel Desire.

Firstly, as a major element of tourism market, obviously population is of vital importance. Tourists are the objects of tourism market; therefore, it's impossible to form a tourism market without consumers.

Secondly, the purchasing power of tourists, to a great degree, is influenced by the domestic and global economic situation, as well as the personal or family incomes. Accordingly the economic capability to buy commodities or pay for the labor is directly related to the purchasing power.

Finally, the travel desire represents the degree of individual desire towards tourism, namely, how willing they are to open their purses for traveling. Thus travel desire is also an important element and moreover it is definitely affected by people's expectations to clothing, food, hotel and transportation during traveling.

All in all, the paper built a tourism market capacity model based on the three above key factors.

Let t donate one certain time period, s a certain space, a one certain age group;

Denote as $TMC(t,s,a)$ tourism market capacity of one certain age group in a certain region, in a certain period;

Denote as $P(t_1, s, a)$ the population of one certain age group at in a certain region, at a given time(t_1);

Denote as $PP(t,s,a)$ the purchasing power of one certain age group in a certain region, in a certain period;

Denote as $TD(t, s, a)$ the travel desire of one certain age group in a certain region, in a certain period;

Obviously, TMC, PP and TD are stocks while P is a flow. Therefore to simplify the model, $P(t,s,a)$ can replace $P(t_1, s, a)$ to express the population of one certain age group in a certain region, at the very starting point of a given period. Consequently, on the base of the relations among those three factors involved in the formation of tourism market, namely, Tourism Market=Population x Purchasing Power x Travel Desire, the tourism market capacity model can be built as follows:

$$TMC(t,s,a) = P(t,s,a) \times PP(t,s,a) \times TD(t,s,a) \quad (1)$$

The $P(t,s,a)$ is mainly influenced by the following factors: national population, urbanization rate, aging rate. Denote as $NP(t)$ the national population at the starting point of a period, $UR(t)$ the urbanization rate in a certain period, $AR(a)$the aging rate at a certain age or above. According to the definitions of those variables and their connections, the population model of one certain age group in a certain region, in a certain period can be worked out as follows:

$$P(t,s,a) = NP(t) \times UR(t) \times AR(a) \quad (2)$$

The $PP(t,s,a)$ is mainly determined by the following factors: the average income of urban and rural areas, per capita income and gross domestic product growth rate. Denote as $AIURA(t)$the average income of urban and rural areas at the starting point of a period, $PCI(t, s, a)$ the per capita income growth rate of one certain age group in one certain region at a given time, $GDP(t)$the gross domestic product growth rate in one certain period. What should be pointed out specifically here is that if the gross domestic product growth rate is more than zero, the national economy is booming, which implies that people are able to spend much more money. Hence on the basis of the definitions of those variables and their connections, we can get the purchasing power model of one certain age group in one certain region, in a certain period, namely,

$$PP(t,s,a) = PCI(t,s,a) = AIURA(t,s,a) \times (1 + PCI) \quad (3)$$

The main factors impacting the $TD(t, s, a)$ are as follows: economic capacity rate, travel preference degree and gain information ability. Denote as $ECR(t,s,a)$ the economic capacity rate of one certain age group in a certain region, in a certain period, $TPD(t,s,a)$ the travel preference degree of one certain age group in a certain region, in a certain period, $GIA(t, s, a)$ the gain information ability of one certain age group in a certain region, in a certain period. What has to be specified here is that the GIA here refers to the ability to acquire information through whatever media and it is a non-dimensional data. So according to the definitions of those variables and their connections, the travel desire model of one certain age group in one certain region, in a certain period can be established as follows:

$$TD(t,s,a) = ECR(t,s,a) \times TPD(t,s,a)GIA(t,s,a) \quad (4)$$

Integrating the above analysis of models, we can get the tourism market capacity model affected by the nine major factors:

$$TMC(t,s,a) = NP(t) \times UR(t) \times AR(a) \times AIURA(t,s,a) \times (1 + PCI) \times ECR(t,s,a) \times TPD(t,s,a) \times GIA(t,s,a) \quad (5)$$

Since of all those figures, purchasing power is the most difficult to predict, the paper makes it equivalent to the per capita income. In order to get more accurate figures and minimize the influence of uncertainties, this paper is going to build a mathematical model to make prediction scientifically.

Denote as PCI the per capita income growth rate, $PCI(t, s, a)$ the per capita income in a given period. Because when we predict the PCI growth rate on the basis of only PCI sample data, there are many uncertainties, it is hard to ensure the accuracy of the figures. Since GDP growth rate has two properties of periodic fluctuation and inertial growth, it is much easier to get relatively accurate predicative data. In addition, PCI growth rate is tightly connected to the GDP, therefore, if take PCI growth rate (PCI) as the dependent variable, GDP growth rate (GDP) the independent variable, there is a one-to-one correspondence between them in the same time series. What has to be noted here is that the paper is to analyze and predict only the data from cities or towns for the accuracy, because there are great difficulties in collecting the data in rural areas. After the correlation analysis in the SPSS, it

is found that correlation between PCI and GDP is significant at the 0.01 level and the correlation was 0.668**, the conspicuousness is 0.002.

We get the linear regression equation of PCI and GDP as follows:

$$PCIt = At + \beta_1 GDP_t \quad (6)$$

Based on the above analysis, if we want to figure out the per capita income growth rate, we need to predicate GDP growth rate first. Thus to predicate GDP growth rate, we build the Auto-Regressive Moving Average Model of GDP as ARIMA (p, d, q). Once we get the predicative GDP growth rate of one year, we can work out the predicative GDP growth rate of the next year by putting the data of last year into the model, and repeat this again. To ensure that the data is accurate, this paper makes predictions only on the next five years. The basic model is as follows.

① ARMA (p, q) (Auto-regressive Moving Average)

$$X_t = \Phi_1 x_{t-1} + \Phi_2 x_{t-2} + \cdots + \Phi_p x_{t-p} + \delta + u_t + \theta_1 u_{t-1} + \theta_2 u_{t-2} + \cdots + \theta_q u_{t-q} \quad (7)$$

$$\Phi(L)x_t = (1 - \phi_1 L - \phi_2 L^2 - \cdots - \phi_p L^p)x_t = \delta + (1 + \theta_1 L + \theta_2 L^2 + \cdots + \theta_q L^q)u_t = \delta + \Theta(L)u_t \quad (8)$$

$$\Phi(L)X_t = \delta + \Theta(L)u_t \quad (9)$$

The stationarity condition for ARMA (p, q) is that all Φ (L) =0 roots should lie outside the unit circle; the condition of reversibility for ARMA (p, q) is that all Θ (L) =0 roots should lie outside the unit circle.

② ARIMA (p, d, q). (Autoregressive Integrated Moving Average Model)

Difference Operator

$$\Delta x_t = x_t - x_{t-1} = x_t - Lx_t = (1 - L)x_t$$
$$\Delta^2 x_t = \Delta x_t - \Delta x_{t-1} = (1 - L)x_t - (1 - L)x_{t-1} = (1 - L)^2 x_t$$
$$\Delta^d x_t = (1 - L)^d x_t \quad (10)$$

To order of integration d — $x_t \sim I(d)$

$$w_t = \Delta^d x_t = (1 - L)^d x_t \quad (11)$$

So w_t is stationary series. Build ARMA (p, q)model for w_t and we can get the model $x_t \sim$ ARIMA (p, d, q) as follows.

$$w_t = \phi_1 w_{t-1} + \phi_2 w_{t-2} + \cdots + \phi_p w_{t-p} + \delta + u_t + \theta_1 u_{t-1} + \theta_2 u_{t-2} + \cdots + \theta_q u_{t-q} \quad (12)$$

$$\Phi(L)\Delta^d x_t = \delta + \Theta(L)u_t \quad (13)$$

Model of predicating GDP:

First exclude the insignificant variables and then follow the following steps.

①Determine the order of integration

Use the term with no time trend to explain the model containing no variable which carry difference, first-order difference and second-order difference. In other words, do unit root test on model $\Delta GDP = \alpha + \delta GDP_{t-1} + \varepsilon_t$ and $\Delta^2 GDP = \alpha + \delta GDP_{t-1} + \varepsilon_t$.

Hypothesis $H_0: \delta = 0$; alternative hypothesis $H_1: \delta < 0$. The result is as follows

Table 1 First order difference

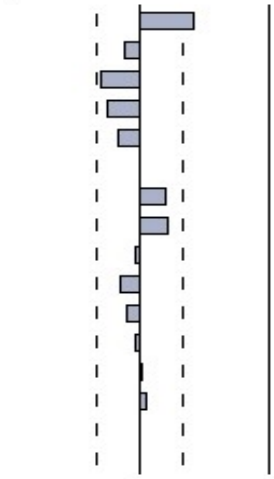
	Non-Difference Test Statistics	First-order Difference Test Statistics
ΔGDP	-3.35	-5.10
Critical Value (Level 1%)	-3.67	-3.67
Critical Value(Level 5%)	-2.96	-2.96
Critical Value (Level 10%)	-2.62	-2.62

From the above table we can know that when α=5%, in the root unit test the observation value of t is -3.35. Because t=-3.35<τ=-2.96, the hypothesis should be denied. In other words, non-difference time series of GDP is stationary, and then d=0.

②Determine the auto-regressive order p and moving average order q

Because d=0, we can use auto-correlation function (ACF) and partial auto-correlation function (PACF) of the first order difference of GDP, ΔGDP, to get the value of p and d. The results of ACF and PACF are as follows.

Date: 09/16/14 Time: 20:04
Sample: 1978 2012
Included observations: 32



	Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
1				0.436	0.436	6.6744	0.010
2				-0.130	-0.395	7.2865	0.026
3				-0.307	-0.082	10.833	0.013
4				-0.255	-0.128	13.364	0.010
5				-0.177	-0.147	14.632	0.012
6				-0.000	0.053	14.632	0.023
7				0.221	0.126	16.748	0.019
8				0.228	-0.006	19.110	0.014
9				-0.034	-0.156	19.163	0.024
10				-0.154	0.043	20.341	0.026
11				-0.108	-0.015	20.941	0.034
12				-0.025	0.011	20.976	0.051
13				0.018	-0.005	20.994	0.073
14				0.052	-0.024	21.160	0.098
15				0.008	-0.101	21.164	0.132
16				0.000	0.082	21.164	0.172

Figure 1. The results of ACF and PACF

The PACF of GDP is 0.436 when coefficient equals 1, -0.395 when coefficient equals 2 and obviously approximate 0 when coefficient is equal to or greater than 5, so we take p=4.

The ACF of Deuro equals 0.436 when coefficient equals 1 but obviously approximates 0 when coefficient is equal or greater than 5, so we define q=4.

③ the estimation and test of ARIMA (p, d, q)

After testing and screening the model, we choose ARIMA(2, 0, 2). In the following data processing and analysis, we use

$$X_{t+1} = \phi_1 X_t + \phi_2 X_{t-1} + u_{t+1} + \theta_1 u_t + \theta_2 u_{t-1} \quad (14)$$

In the formula, the observed value is known, so only error processing needs to be dealt with.

As for the error terms whose subscripts are greater than t, we use expected number 0 to replace the future error since it is unknown. For the error terms whose subscripts are between 1 and t, we use residual estimated value to replace them.

Thus, step 1 predictor formula:

$$\hat{X}_t(1) = \phi_1 X_t + \phi_2 X_{t-1} + \cdots + \phi_p X_{t-p+1} + 0 + \theta_1 \hat{u}_t + \theta_2 \hat{u}_{t-1} + \cdots + \theta_q \hat{u}_{t-q+1} \quad (15)$$

So, $$X_{t+1} = \phi_1 X_t + \phi_2 X_{t-1} + 0 + \theta_1 u_t + \theta_2 u_{t-1} \quad (16)$$

Those are correlative formulas we use in this paper for the capacity model of the senior tourism market.

Calculations on the Senior Tourism Market Capacity

In the second part, we have built the senior tourism market capacity model. In this part, we will apply some authoritative data to the quantitative analysis so that we can get a relatively accurate value of the senior tourism market capacity and specific values of the segment markets capacities.

The Senior Tourism Market Capacity Mode:

$$\mathrm{TD}(t, s, a) = \mathrm{ECR}(t, s, a) \times \mathrm{TPD}(t, s, a) \times \mathrm{GIA}(t, s, a) \quad (17)$$

$\mathrm{TMC}(t, s, a)$ denotes the tourism market capacity of one certain age group in a certain region, in a certain period;

$\mathrm{P}(t_1, s, a)$ denotes the population of one certain age group at in a certain region, at a given time(t_1);

$\mathrm{PP}(t, s, a)$ denotes the purchasing power of one certain age group in a certain region, in a certain period;

$\mathrm{TD}(t, s, a)$ denotes the travel desire of one certain age group in a certain region, in a certain period;

Next, this paper is going to do some calculations on the population, purchasing power and travel

desire respectively and then we can get the senior tourism market capacity and different segment markets capacities.

Calculations of Population

According to The Data of the Fifth National Population Census in 2000 issued by National Bureau of Statistics in 2012 and China's 2010 Population Census Data compiled and published by the Census Office of the State Council, National Bureau of Statistics and Employment Statistics Department in 2012, we get the key data about China's total population and aging population from 1953 to 2010[11, 12]. These data are shown in the following table 2.

Table 2. China's Total Population and the Number of the Aged in Each Population Census

Year	>60 (Million)	>65(Million)
1953	41.538	25.038
1964	42.555	24.758
1982	76.638	49.276
1990	96.97	62.993
2000	129.978	88.274
2010	177.596	118.928

The ratio of the population at the age of 60 and above and at the age of 65 and above is shown in the following Figure 2. The figure shows that from 1964 the aging population begins increasing and by 2010 in the sixth population census, the ratio of the population reaches 13.3% and 8.91% respectively for people aged 60 and above and people aged 65 and above. In the light of the growing trend of the aging population ratio, the aging population will increase continuously.

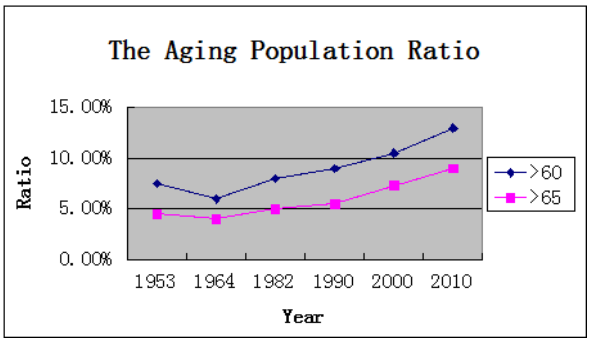


Figure 2. The Aging Population Ratio from Population Censuses

Based on the statistics and predictive data about China's total population and aging population from 1950 to 2010-the data from 1950 to 2010 are estimations and the data from 2011 to 2100 are predictions and the population of China includes Taiwanese but excludes people in Hong Kong and Macao according to the statistical caliber of the United Nation—we extract the data in ten years from 2014 to 2023 for statistic and analysis and get the predictive value of the ratio of the aging population in China in next ten years [13]. The result is shown in Figure 3. From the figure, we can see the number of population aged 60 and above and 65 and above are increasing dramatically which indicates that China is entering the aging society at high speed.

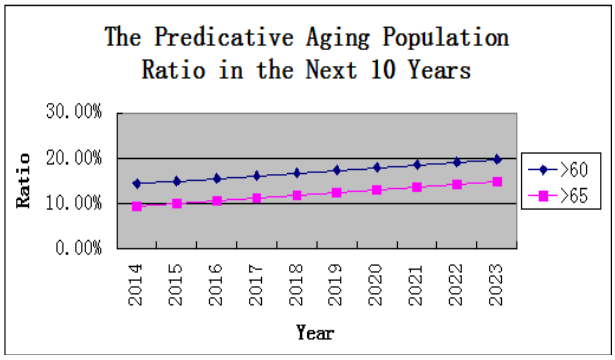


Figure 3. The Predicative Aging Population Ratio in the Next 10 Years From the UN

According to the current empirical analysis about China's urbanization, the speed of urbanization is basically appropriate on the whole. Through qualitative analysis and time series forecasting method, it is estimated that China's urbanization will keep the trend of rapid development and the rate of urbanization will increase by around 1% annually. By 2020 the rate of urbanization in China will reach about 60%. China Statistical Yearbook issued by National Bureau of Statistics in 2013 shows that the rate of urbanization is 52.57% in 2012 [14]. Prediction about changes in urban population in next yen years, from 2014 to 2023, is made in this paper based on the data in the yearbook.

Table 3. The Aged Population in Urban Areas (2014-2023)

Year	Total (Millions)	The Rate of Urbanization (%)	Urban Population (Millions)	Urban Population Aged 60 and above(Millions)

2014	1364.773	0.5457	744.756626	108.236321
2015	1369.743	0.5557	761.166185	114.695924
2016	1374.247	0.5657	777.411528	120.960237
2017	1378.294	0.5757	793.483856	127.051233
2018	1381.887	0.5857	809.371216	133.103254
2019	1385.048	0.5957	825.073094	139.353292
2020	1387.792	0.6057	840.585614	145.970672
2021	1390.113	0.6157	855.892574	152.75517
2022	1392.006	0.6257	870.978154	159.752473
2023	1393.482	0.6357	885.836507	167.196728

Form Table 3, we can see that the number of the old people aged 60 and above in cities and towns will be large in next ten years and the number will keep growing every year. Obviously, Figure 4 shows the number of the elderly population in cities and towns will keep rising in next ten years.

The research result of earlier stage in this paper shows the chief participants in the senior tourism market are the aged people in cities and towns and the rural aged people just take a low percentage that can be ignored. Therefore, this paper analyzes the capacity of the future senior tourism market in our country based on statistical characteristics of the elderly people in cities and towns.

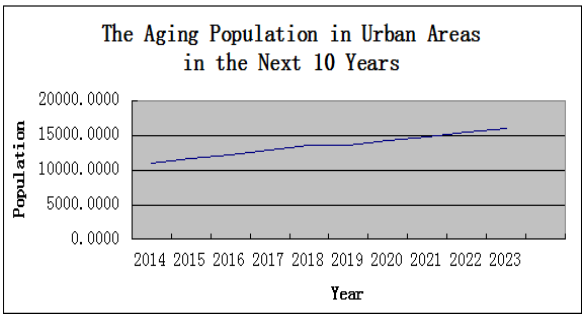


Figure 4. The Aging Population in Urban Areas in the Next 10 Years（2014-2023）

Calculations of Purchasing Power

The purchasing power mainly refers to retirement pay of the elderly people, which is also the main source of income for them. With the rapid development of society and gradual change of population structure, sources of income for the old people presents diversification tendency: besides retirement payment, interest on deposit, investment dividends, money from their children and so on are also sources of income for the old people. But it's hard to survey these on account of family privacy. That the income of the elderly people presents a rising trend can be certain. As China's social pension insurance system is being further reformed and gradually improved and the burden of raising children for the elderly is further alleviated, the proportion of consumption still increases in spite of the elderly people's low income. Because the chief participants in the senior tourism market are the old people in cities and towns and the rural old people just take a low percentage that can be ignored, we regard per capita income of urban residents as that of the aged people and make relevant analysis in this paper.

Table 4. The Growth Rate of Per Capita Income of Urban Residents and the Growth Rate of GDP

Year	Growth Rate of Per Capita Income of Urban Residents (%)	Growth Rate of GDP (%)	Year	Growth Rate of Per Capita Income of Urban Residents (%)	Growth Rate of GDP (%)
1978	-	11.7	1996	12.98	10
1979	-	7.6	1997	6.65	9.3
1980	-	7.8	1998	5.13	7.8

1981	-	5.2	1999	7.90	7.6
1982	-	9.1	2000	7.28	8.4
1983	-	10.9	2001	9.23	8.3
1984	-	15.2	2002	12.29	9.1
1985	-	13.5	2003	9.99	10.
1986	-	8.8	2004	11.21	10.1
1987	-	11.6	2005	11.37	11.3
1988	-	11.3	2006	12.07	12.7
1989	-	4.1	2007	17.23	14.2
1990	-	3.8	2008	14.47	9.6
1991	-	9.2	2009	8.83	9.2
1992	-	14.2	2010	11.26	10.4
1993	-	14	2011	14.13	9.3
1994	-	13.1	2012	12.63	7.7
1995	-	10.9	2013	9.73	7.7

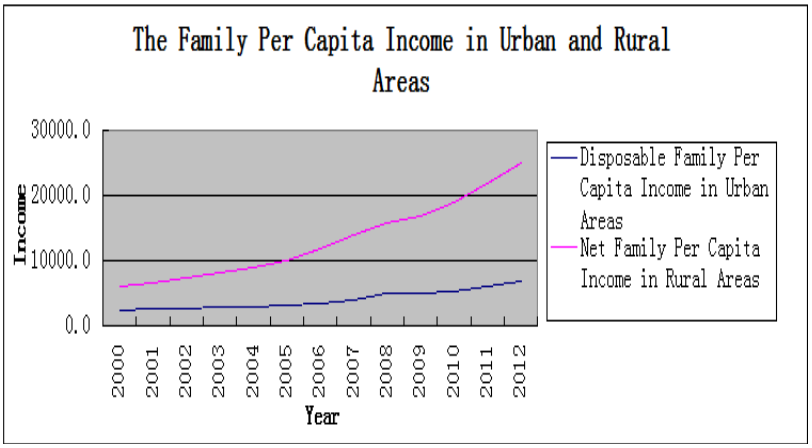


Figure 5. The Family Per Capita Income in Urban and Rural Areas

According to China Statistical Yearbook compiled by National Bureau of Statistics of China in 2013, family per capita income of urban and rural residents and the data in Engel coefficient, we get the following Figure 5. From the point of view of economics, per capita income is closely related to GDP. To predict scientifically the growth rate of per capita income, we collect data about the growth rate of GDP and per capita income from 1998 to 2013 in this paper, as shown in Table 4 and take these data as samples to do correlation test and model building as well as predict the growth rate of GDP and per capita income in next five years.

According to the data in Table 4, we did regression analysis and got the following result:

Table 5. Regression analysis output results

Model summary				
Model	R	R Square	Adjusted R Square	
1	0.668	0.446	0.441	
a. Predictive variable:(Constant)The Growth Rate of GDP				
Anova				
	Quadratic sum	df	F	Sig
Regression	69.961	1	12.881	0.002
Residual error	86.899	16	-	-
Total	156.86	17	-	-

Coefficient				
Model	Unstandardized Coefficient		t	Sig
1	B	SE		
Constant	0.540	2.911	0.186	0.855
Growth Rate of GDP	1.078	0.300	3.589	0.002

In Table 5, goodness of fit R Square=0.446. Through goodness of fit tests and variance analysis we can get that F=12.881, P=0.002. The fitting degree is good. Although constant term is not significant, it affects little, so it can be ignored. We build model based on the outcome:

$$PCI_t = 0.540 + 1.078GDP_t \quad (18)$$

We take the results we get each time as new samples to make analysis and prediction and revise the data continuously [15, 16]. The final result is shown in the following Table 6.

Table 6. The Predicative Value of the Growth Rate of GDP and Per Capita Income of Urban Residents in Next Five Years

Year	The Growth Rate of GDP (%)	The Growth Rate of Per Capita Income of Urban Residents (%)
2014	7.82	8.97
2015	7.9	9.06
2016	8.4	9.60
2017	9.24	10.50
2018	10.23	11.57

Calculations of Travel Desire

Travel desire includes financial affordability, tourism preference degree and the ability of obtaining information. When analyzing the elderly people's desire to travel, we take the proportion of travel fees in their incomes as the evaluation value for financial affordability, tourism preference degree and the ability of obtaining information in this paper.

The calculation in this paper is based on the relevant conclusion in *The Survey of the Tourism Situation among Shanghai Seniors* issued by Shanghai senior tourism professional committee and the Department of Tourism in East China Normal University [17].

There were 569 valid questionnaires in this survey. Through analyzing the questionnaires, the researchers found travel fees of the elderly people just account for a little proportion in their income. Most people just spend about 10%-20% of their income on travel. This paper takes the median 15% as the proportion the seniors' travel fees account for in their income.

As for ways of travel, the research conclusions are as follows: sightseeing accounts for 68.3%, vacation and recuperating accounts for 22.8%, adventure accounts for 5.7% and business visit accounts for 1.4% which are the basis of calculation about various tourism markets in this paper [18].

Calculation on the Senior Tourism Market Capacity

Set one year as a time unit. Referring to all the accessible demographic statistics, we can get the population at the age of 60 or above.

$t = 2014,2015 \ldots 2018, S = \text{City}, a = 60.$

Together with the figures above of three aspects, the senior tourism market capacity in China in the next five years (2014-2018) can be worked out as follows:

Table 7. Senior Tourism Market Capacity Predicative Value （2014-2018）

Year	Market Capacity （Billions of CNY）	Market Capacity Growth Rate（%）
2014	4768.8160	—
2015	5511.2615	13.47
2016	6370.2463	13.48
2017	7393.5796	13.84
2018	8644.2782	14.47

From the Table 7, it is quite obvious that the senior tourism market capacity in the next five years is on the increase over years and the growth rates are all over 12%. When making analysis on the features of the senior tourism market, the paper mainly focuses on the travel features of the senior people based on the research of senior people in Guangzhou city [19]. According to the statistics released on the China Economic Weekly 12 Match, 2013, the urbanization rate in Guangzhou is 83.8%, which provides a base for this paper to do detailed estimations and predictions on the travel consumption of the

senior people in cities or countries, in the next five years.

Table 8. The Predicative Senior Tourism Market Capacity (Billions of CNY)

Year	Total Market Capacity	Sightseeing	Vacation and Recuperating	Adventure	Business Visit
2014	476.88160	325.71	108.729	27.182	6.676
2015	551.12615	376.419	125.657	31.414	7.716
2016	637.02463	435.088	145.242	36.310	8.918
2017	739.35796	504.981	168.574	42.143	10.351
2018	864.42782	590.404	197.090	49.272	12.102

As can be seen from the above figures, the senior tourism market capacity grows fast from 477.73060 billion CNY in 2014 to 831.24466 billion CNY in 2018. Particularly the senior sightseeing market capacity is on the large scale reaching almost 600.0 billion CNY. Moreover, the senior tourism market capacity for purposes of vacation and recuperating is also very large.

Therefore the tourism corporations in China must make their marketing plans according to the travel features of the senior people so as to provide satisfactory services, and profit from the booming senior tourism market [20]. In addition, the two segment markets, the senior sightseeing market and the senior vacation and nursing market, should be given extra weight.

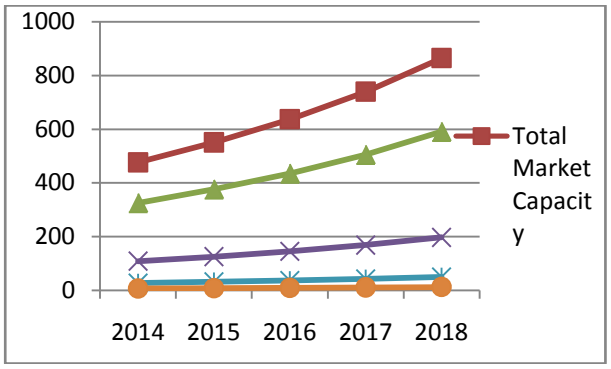


Figure 6. The Senior Tourism Market Capacity in China in the Next 5 years

Conclusion

At present, China has already stepped into the aging society. At the meantime, with the development of economy, people's living standards have been improving and traveling has gradually become an important leisure activity for the seniors, which will definitely bring great economic benefits to the tourism industry. In the next five years, the tourism market capacity only for the seniors in cities and towns will increase to more than 800 billion CNY from 400 billion at present. In just five years, the capacity is doubled, therefore it is safe to say that this market has a great potential.

By the way of doing survey and studying the documents, the paper made multidimensional analysis on the consumption requirement of seniors on tourism, consumption features and the macro market environment with the help of some professional software like E-views and SPSS, etc. Besides, in the process of building the senior tourism market capacity model, the paper cited authoritative data and built LRM and ARIMA as sub-models to minimize the uncertainties of estimation, which makes the model more reliable. Furthermore, through the analysis and regression of authoritative data, this paper has worked out the predicative value of the senior tourism market capacity and different segment markets capacity in the next five years, which could provide relatively more accurate basis of decision for domestic tourism corporations in their future marketing practices.

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