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The Prospect Forecast of the Market Development of Chinese Elderly Care Institutions

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Abstract: With the aggravation of population aging and economic development, China is not only facing more and more serious pension pressure, but also has greater capacity to support pension services, which has brought about the vigorousdevelopment of pension services. Obviously, it can be expected that there may be some internal relations among these indicators. For this reason, this paper selects relevant data from China's civil affairs statistical yearbook, takes the number of beds used by China's pension institutions as the main development indicator of the pension industry, establishes data links for different indicators such as GDP, the number and proportion of China's aging population, and uses linear regression with the least square method to establish mathematical models. After testing the regression coefficients, strong linear results are obtained. It can be concluded that there is a linear relationship between the development of pension services and the aging of the population and the development of GDP.

Keywords: linear regression, statistics

1. Introduction

Population of old is the trend of future development in Chinese society and a huge challenge in the process of China's modernization. Recently, the improvement of the medical system and the decrease of newborns have led to an increasing number of elderly people in Chengdu, and the pension problem has become a major problem for the country. China's aging trend has shown a growing trend since 1999. China has reached the standard of an aging country and urgently needs to solve the problem of old-age security. The national conditions of the elderly population with a large base, high proportion, rapid growth rate, and many nests have brought a series of challenges to our society: a sharp increase in social welfare expenditure, aggravation of social support burden, changes in family structure, support functions, and the needs of the elderly. Growth and changes, etc., for the government, have greatly increased the financial burden of my country's old-age security. On the other hand, Too many old people need to be taken care of, leading to the development of the pension market prospects are excellent.

In view of the above social development background, we can understand that elderly care services are a common problem faced by my country. The demand for elderly services has

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gradually increased, and social elderly care services have become increasingly important. In modern society, the elderly care industry has become an emerging industry and has gradually developed and expanded. Due to the increasing pressure of life and the tightness of time, people's needs for elderly care services are getting higher and higher, but at the same time, Problems in the senior care business have also been highlighted.The issue of senior care is becoming more prominent, and the elderly's need for institutional care services is expanding, which will present significant potential for the growth of elderly care institutions in the future [1-20].

China's economy has shown a medium-to-high-speed development, and people's consumption level has also increased. As of 2019, the low consumption level in my country has reached 27,504 yuan. The demands of the aged care market will alter as the economy develops, per capita income rises, and societal attitudes shift. It will continue to grow, and people will gradually be able to afford the consumption of elderly care services. The pressure of spending money on people on elderly care services is progressively diminishing, and market demand is rising, along with the government's financial support for the elderly care services sector. Civil affairs data show that the amount of elderly care beds in my country is on the rise as a whole. Financial investment from the central to local governments for elderly care institutions and facility construction continues to increase, and the amount of various elderly care service facilities has grown. By 2019, the amount of elderly care beds in my country reached 7.75 million. The current number of beds is still insufficient compared to the number of elderly people. The market has a huge demand for the number of elderly beds. The huge market demand makes it a trend in the future, and the popularity of the elderly care market is increasing [1-20].

There are challenges and opportunities in my country's elderly care industry market. The main problems existing in China's elderly care industry are the unbalanced supply relationship, the shortage of beds in elderly care institutions. The lack of professionalism has caused huge resistance to the development of the elderly care industry in my country. At the same time, behind these difficulties and challenges, there is a huge development space for the elderly care market in my country. Through research, analysis and prediction of the development status of my country's elderly care institution industry.Based on the data of the China Civil Affairs Statistical Yearbook in recent years, this paper selects an appropriate indicator system to forecast the development of my country's elderly care institution market, reasonably analyzes the current development of elderly care institutions, and makes correct decisions based on the results of the regression model. In response to decision-making, the service guarantee capability of my country's elderly care institutions has been continuously improved.

2. Formatting of Manuscript Components

China Civil Affairs Statistical Yearbook 2021 contains the main statistical indicators of civil affairs of all provinces, autonomous regions and municipalities in 2020 as well as some historical data, from which we take out our dataset, including year, GDP, old-age dependency ratio, number of old-age beds, consumption level, number of elderly people and their proportion, They are all numerical data.

We can see from the above, in 2007, there were only 100 million people over 65 years old, but by 2020, the number has exploded to 130 million, even if the increase rate is 30 percent, but there is an increase of 30 million people. Apparently, the average number of beds over the 14 years was 509, compared to just 242 in 2007. Let's take a look at GDP. From 2007 to 2000, the average GDP was 59,705 billion, and the median was 58,814 billion, which is far from the minimum of 27,070 billion. This means that the corresponding pension beds have a significant increase with the change of GDP and the increase of the elderly.

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The first step in data analysis is to make it easier to read and understand the data, but this step also plays an important role in our entire process. We first used Pandas Library to input data, understand the data structure, and perform descriptive statistics on the data. This gives us a comprehensive view of the data and key information such as minimum, maximum, median, and average. Then we get beautiful line maps and heat maps, and they give us a lot of information.Obviously, the variable 'over 65' seems to be most correlated with 'price'. The variable will be used as our variable to complete the linear regression process. The third step is to perform a simple linear regression.

To construct a linear model, first import the library that needs to execute linear regression. In order to better pass more samples, add constant to the dataset through ADD_constant, continue to fit regression lines through OLS, output regression results, and analyze OLS regression results. At last. The resulting graph gives us the different parameters of all the linear regressions that have been completed.

3. Mathematical Analysis

Heat map is a very common map. Its basic principle is to use color to represent numbers, so that the data can be presented more intuitively and the comparison is more obvious. It is often used to represent the expression difference of representative genes in different sample groups, the content difference of representative compounds in different sample groups, and the pairwise similarity between different samples. In fact, any table data can be converted into heat map display.

The heat map maps each value in the data matrix into a color display according to a certain rule, and uses the color change to visually compare the data. When applied to a numerical matrix, the color of each cell in the heat map shows the size of the data value at the intersection of row variables and column variables; If the behavior gene is listed as a sample, it is the expression value of the corresponding gene in the corresponding sample; If both rows and columns are samples, the correlation between the corresponding two samples may be displayed. Number mapping to color can be divided into linear mapping and interval mapping. Linear mapping is that each value corresponds to a color, and interval mapping is that the value is divided into different interval blocks, and all the numbers in each interval block are displayed in the same color. There is no good or bad difference between the two, and the specific use depends on the intention of display. The sample correlation heat map is a symmetric heat map, and each cell represents a correlation value. Consider the two random variables X and y, take samples from each of them, and record them as and, and use and to record the average value of the two groups of samples. The sample correlation coefficient is calculated based on the sample observation value, and the specific value will b different depending on the sample taken. The sample correlation coefficient is a consistent estimate of the population correlation coefficient. Characteristics of correlation coefficient knowledge are listed as follows: the value of r is between - 1 and 1; when r = 0, there is no linear relationship between the sample observations of X and Y; $0 < |r| < 1$, that is, there is a certain linear relationship between the sample observations of X and Y. When $r > 0$, X and Y are positively correlated. When $R < 0$, X and y are negatively correlated; if $| R | = 1$, it indicates that X and Y are completely linear. When r = 1, it is called full positive correlation, and when r = − 1, it is called full negative correlation.; R is a measure of linear correlation between variables. R = 0 only indicates that there is no linear relationship between the two variables, and does not mean that there is no other type of relationship between X and y. For the possible nonlinear correlation between the two, we need to use other indicators to analyze, In regression analysis, the simplest model is a linear regression model with only one dependent variable and one independent variable, that is, a univariate linear regression model, also known as a simple linear regression model. This population regression

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shows the effect of the other factors in the equation on y. The least square method is a method for estimating regression coefficients by minimizing the sum of squares of residuals.

If the absolute value of $t_{\hat{\beta}_2}$ is greater than the absolute value of the critical value, reject the original hypothesis and accept the alternative hypothesis; Otherwise, accept the original hypothesis.

And finally we came to some pictures like this.

Table 1: OLS regression results.

Dep. Variable:	Beds(10000)	R-squared:	0.909
Model:	OLS	Adj. R-squared:	0.896
Method:	Least Squares	F-statistic:	69.98
Date:	Thu, 25 Aug 2022	Prob (F-statistic):	6.84e-05
Time:	11:05:57	Log-Likelihood:	-49.802
No. Observations:	9	AIC:	103.6
Df Residuals:	7	BIC:	104.0
Df Model:	1		
Covariance Type:	nonrobust		

	coef	std err	t	P>|t|	[0.025	0.975]
const	-646.1049	141.617	-4.562	0.003	-980.976	-311.234
Over 65	0.0852	0.010	8.366	0.000	0.061	0.109

Omnibus:	1.667	Durbin-Watson:	1.915
Prob(Omnibus):	0.434	Jarque-Bera (JB):	1.029
Skew:	0.575	Prob(JB):	0.598
Kurtosis:	1.808	Cond. No.	8.51e+04

R-Squared signifies the “percentage variation in dependent that is explained by independent variables”. Here, 90.9% variation in Beds(10000) is explained by Over 65. From the value of R-Squared, it can be seen that the linear regression model can well fit the relationship between variables The Prob of const and Over 65 is less than 0.05, and the confidence interval of const and Over 65 does not contain 0, so the null hypothesis is rejected, indicating that there is a linear relationship between Beds (10000) and Over 65, and the number of people aged 65 and above under the 95% confidence interval Significant impact on the number of retirement beds After the linear regression, the const is -646.1049, and the coefficient of the 0.0852 term is 0.0825. This means that for every 10,000 increase in the percentage of people over 65 in the population , the number of pension beds increases by 0.0825 million. The model is Beds(10000)=-646.1049+0.0852*0.0852.

4. Conclusion

It can be seen from the model results that GDP, old-age dependency ratio, and consumption level do affect the number of pensions and beds in my country. The increase in GDP will bring about economic growth, the consumption level of residents will increase, and there will be more ability to bear the expenses of elderly, and The aged care institution business will grow in accordance with

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the rise in demand for such facilities. The proportion of older persons who are dependent on each adult is rising along with the old-age dependency ratio. Due to the inconvenience of life and work, residents' demand for elderly care institutions is increasing, which promotes the elderly care institution industry. The improvement of the economic situation can stimulate the consumption demand of the elderly for various elderly care services. According to the results, it can be found that the better the economic situation of the elderly, the greater the willingness to live care services and stay in elderly care institutions, that is to say, there are plans and steps. The improvement of the economic situation of the elderly can greatly increase the consumption power of the elderly and directly stimulate the great development of the economy. In terms of the law, reinforce the pertinent legislative efforts for the protection of the elderly's rights and interests, and enhance a number of long-term legal mechanisms to safeguard the elderly's fundamental rights;so as to safeguard the enormous senior population in my nation and to give the elderly social support. Taking care of the elderly creates a legal foundation. On the government side, it is necessary to strengthen planning and expand the space for the elderly care business. The reality of insufficient social pension resources, the government and relevant departments must put the cause of pensions on the agenda. In light of my country's economic and social development, the development trend of aging, and the degree of aging, scientific plans should be formulated to guide the rational allocation of resources. Combined with social security, labor and employment, explore suitable old-age service systems and mechanisms, and advance step by step. In terms of pension institutions, strengthen team building and improve service quality. Strengthen the quality training of employees, identify the qualifications of employees, promote management with quality, and promote efficiency with service, so as to achieve a positive interaction between quality and service. Attract more professional staff and provide professional services.

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