The Impact of Pension Insurance on Consumption: Evidence from China

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Abstract. Investment, export and consumption have been the three core forces driving China's economic growth. In the past decade, the role of national consumption in driving the economy has become more and more obvious. Expanding consumer demand and increasing the consumption of the population is a common concern of the Chinese Government and many scholars today. In thinking about the causes of under consumption, the relationship between the social security system and consumption demand should not be overlooked, especially pension insurance, which accounts for the largest share of social insurance. A decline in youth and a growth in the elderly population, coupled with a shortage of workers, would unavoidably result in lower spending, especially in China. Therefore, the data in this paper comes from the National Bureau of Data and Statistics (NBDS), which includes pension insurance data and per capita consumption levels in 31 provinces from 2017-2022. The investigation is mainly carried out through the dependent variable (pension insurance fund income). Applying the knowledge of econometrics, the ordinary least squares method is used to find that the purchase of pension insurance has a dampening effect on consumption. With the general environment of economic transformation and aging, there is a greater need to continuously improve the pension insurance system to ensure that residents have a secure old age while looking for the possibility of pension insurance to stimulate new consumption.

Keywords: Consumption, Pension Insurance, Deposit Money.

1   Introduction

A key consideration in China's economic growth is consumption. China's "final consumption rate" nevertheless lags well below that of wealthy nations and even some developing nations, despite being comparatively low. In addition to the consumption rate, the savings rate of the population remains high, and from the perspective of the overall change in domestic savings, from 2008 to 2021, the savings rate of the residential sector has been maintained at around 22 per cent, far exceeding the average level of the savings rate of the population in market economies [1]. With a low consumption

rate and a high savings rate among the population, continuously improving the consumption capacity of the population is an inevitable requirement for the sustainable development of a country's economy.

At the same time, China's population is ageing, and the pressure on old-age pensioners is increasing, with a certain dampening effect on consumption. In response to the increasingly severe old-age problem, China is creating a multi-level, multi-pillar pension scheme that is augmented by commercial pension insurance and built upon the foundation of basic pension insurance.

China has been enhancing its pension security system to protect and improve people's livelihoods. The foundation of the pension security system is pension insurance, which directly impact on citizens' quality of life in retirement as well as the steady growth of the nation's economy and society as a whole [2]. The lack of pension insurance increases the risk of uncertainty in the future, which inevitably leads residents to limit their current consumption and increase their savings in order to prepare for emergencies and provide an economic foundation for retirement. A robust pension system allows for a smooth transition between the effects of consumption during the working period and retirement by raising future income expectations. Adjustment of income expectations throughout the life cycle, which in turn reduces precautionary savings [3]. Therefore, the pension insurance system has an inseparable role with residents' consumption.

This paper argues that at present China's pension insurance can protect the basic life of residents to a certain extent, so to a certain extent it has a promoting effect on residents' consumption. But its level of protection is limited, can only protect the basic survival of the insured, in some large expenditures or enjoyment-type consumption cannot be fully covered [4]. Therefore, the insured people, especially the old ones, are more inclined to save than to consume, so its promotion effect on consumption is limited. In such a background, using the data from NBDS, and analyzing the impact of pension insurance on residents' consumption through econometrics is necessary. It has the potential to provide theoretical support for improving and enriching the pension insurance scheme in China, optimizing the contribution of business pension plans in complementing basic pension insurance, promoting consumption, and improving people's livelihood.

2   Literature Review

2.1   Positive Effect

Using data from the China Health and Pension Tracking Survey, Zhang et al. measured and analyzed the impact of the current rural coverage on policy using double difference and breakpoint regression methods. They discovered that the new rural insurance can increase family consumption [5]. According to Modigliani and Brumberg's (1954) life-cycle theory, consumers organize their consumption according to their lifetime income, and pensions, as a source of income in retirement, are bound to have an impact on consumption [6]. People are more willing to change their savings into consumption and

participate more in the enjoyment of life after they believe that they can have a certain degree of financial security in their old age.

2.2   Disincentive Effect

In the least squares regression investigation, Han Lu discovered that there is a certain degree of extrusion effect between the basic pension insurance and family consumption when it comes to food and clothes consumption at the 1% negative impact level [7]. Especially if a family member's health condition is poor, the family member is more inclined to basic survival consumption, and Engel's coefficient is higher than other families.

2.3   Insignificant Effect

Li Zhen and Zhao Qing used data from 1987-2012 provinces and constructed a consumption function model based on China's experience to study this issue based on the process of transformation of China's pension insurance system. They found that pension insurance suppresses residents' consumption before the transition, there is a small promotion effect in the transition process, and the level of pension insurance protection hardly affects residents' consumption level after the transaction [8]. Wang used CFPS data and breakpoint regression design to conclude that without considering the problem of self-selection of the sample, whether or not to participate in the new rural insurance does not affect the consumption level of rural residents under the age of 60, and participation in the new rural insurance has a positive impact on the consumption level of rural residents over the age of 60. If the problem of self-selection of the sample is considered, whether or not to participate in the new rural insurance does not significantly affect the consumption of rural residents [9]. By discussing the classification of the degree of consumption, Zhang found that pension insurance can promote developmental consumption; however, for basic survival consumption, pension insurance has a very small effect on this type of consumption [10]. Through the summary of the literature, it is found that there are many scholars concerned with studying the relationship between pension insurance and consumption.

Although the research foundation for this paper is rich thanks to the literature, there is still room for improvement. Firstly, the majority of scholars focus on the consumption purpose of individuals or families when examining the relationship between pension insurance and household consumption. For example, the purpose of consumption for basic survival or enjoyment of development-oriented consumption, less attention to the impact of pension insurance on national development [11]. Secondly, the types of pension insurance studied are more limited, usually rural pension insurance or a sample survey in a certain city. Because of the geographical differences in the sample, it is not representative of other cities in the country. Or the focus on the target group of pensions is more limited. For example, it only focuses on the impact of pensions on the consumption of migrant workers, and the scope of the survey group is small and the target group is relatively single.

3   Data and Empirical Model

3.1   Data Source and Variable Description

This paper uses data from the official website of China's National Bureau of Statistics (NBS), which has covered 3,881 statistical indicators from the NBS and other departments, and loaded nearly 13,000 data statements, and the data on this website is managed by the Chinese government and is authoritative (shown in Table 1). This paper selects data from thirty-one provinces in China over the five-year period from 2017 to 2021, including annual per capita consumption and annual per capita pension insurance data, with a total of 155 sample data.

Table 1. Description of variables.

name	Var label
province	Name of province
year	The year, from which data are generated
PCDI	The annual number of disposable incomes per capital from 2017 to 2021 at province
PCCL	The annual number of consumptions per capital from 2017 to 2021 at provincial le
ISP	Income of the Social Pension Insurance Fund for Urban and Rural Residents
RP	Year-end resident population in China

The size and significance of the regression coefficient, which employs the social pension insurance fund as the explanatory variable for residents of both urban and rural locations, can be used to determine the extent to which pension insurance influences people's consumption. In addition, also considering the complexity of the factors affecting consumption, the disposable income of all residents and the total population size in 2017-2021 were selected as control variables (shown in Table 2). In order to reduce the impact of extreme values of residents' disposable income, the variable PCDI was logarithmically treated.

Table 2. Descriptive Statistics.

Variable	Obs	Mean	Std. Dev.	Min	Max
PCCL	155	20956.10	7409.66	10320	48879
ISP	155	138.328	115.37	8.4	598.1
PCDI	155	30358.59	12431.22	15457	78027
RP	155	4535.27	2989.91	349	12684
year	155	2019	1.42	2017	2021

As can be seen from the descriptive statistics of the variables, the standard deviation of the per capita consumption level and the disposable income of human beings is very large, amounting to a staggering 7,409.653 and 12,431.22, respectively. This data clearly shows that the various provinces' levels of economic development differ significantly from one another, and for this reason, the information that is available to examine how old-age pensions affect spending in a single province is insufficient.

3.2   Model Selection

For the discussion of pension insurance for consumption, different scholars have given different methods to analyze. Since the purpose of this paper is mainly to study the problem of pension insurance as an explanatory variable and other control variables for consumption, the least squares method is chosen. Assuming that the input of the pension insurance fund and the per capita consumption level show a linear relationship, the OLS regression model is established:

$$PCCL = \beta_1 + \beta_2 ISP + \gamma X_i + u_i \tag{1}$$

4   Empirical Analysis

The data for this study is based on Stata 17.0 and the regression result shows that the coefficient of the explanatory variable pension fund income is -4.6 which is significant at 5%. This shows that there is an inverse relationship between the purchase of pensions and people's consumption and that people's purchase of pensions to some extent discourages people's consumption. The possible influencing factors for this result are as follows: (1) In the economic downturn, people's willingness to consume is lowered, and they reduce enjoyment consumption in favor of basic survival consumption and increase their reserves in case of emergencies. (2) The time period chosen for the survey is 2017-2021, which includes the impact of the new crown epidemic, and people, especially the elderly, are concerned about their health and safety, and are purchasing pension funds to increase their financial security for the future (shown in Table 3).

Table 3. First-stage regression.

VARIABLES	(1) PCCL	(2) PCCL
ISP	-4.558**	-6.122***
	(1.856)	(1.196)
PCDI	0.591***	
	(0.00890)	
RP	0.154**	
	(0.0708)	
log_PCDI		21,931***
		(411.7)
Constant	2,944***	-203,160***
	(332.5)	(4,190)
Observations	155	155
R-squared	0.968	0.950

Note: standard errors in parentheses, and ***, **, * represent p<0.01 p<0.05 and p<0.1.

For the control variable PCDI, an increase in personal income will undoubtedly promote people's consumption. The coefficient of this variable is 0.59, suggesting that consumption is significantly influenced by income. This aligns with the income-expenditure theory, which shows that income is an important factor influencing expenditure. Another control variable is population size, the data result shows that the coefficient of population size is 0.15, which indicates that the increase in population size will also stimulate consumption to some extent. But the coefficient of this variable shows that this variable may not be that significant. It is considered to remove the control variable and change it to log PCDI, the data results show that after changing the control variable, the explanatory variable's coefficient shifts from -4.558 to -6.122, and the inhibitory effect of the purchase of pension fund on consumption becomes more obvious. And the model fits better than the original model, and the final model is as follows:

$$PCCL = \beta_1 + \beta_2 ISP + \beta_3 \log\_PCDI + u_i \tag{2}$$

5   Limitation and Outlook

This paper focuses on the impact on people's consumption through the explanatory variable pension insurance fund income and the control variables per capita disposable income and population size. At the same time, the model has some areas for improvement. First, the econometric model may be endogenous. People will increase their savings when purchasing pension insurance, thus taking out less money for consumption; at the meantime, people will also increase their consumption of pension funds in order to have more financial security in their old age, thus making consumption affect the purchase of pension funds in the reverse direction. Therefore, it is reasonable to assume that there is a reverse causal relationship between pension insurance and consumption. Secondly, there are countless factors affecting consumption, and choosing only a few of them will be one-sided. For example, education, living environment and psychological factors all have an important influence on consumption. The level of education will promote consumption, because education requires a certain amount of investment in education, such as tuition fees, etc. Additionally, a gain in income will be influenced by an increase in educational attainment, thus promoting consumption [7]. Psychological factors such as 'overspending' can significantly increase one's consumption level, and conversely, if one is used to a frugal lifestyle, it can inhibit consumption to a certain extent [12]. Moreover, in this study, the geographical economic disparity is too large, so the results may be biased, and in the future study, it is essential to discuss more comprehensively about the influencing factors including the regional economic disparity, and hope to get a more appropriate econometric model.

6   Conclusion

This study explores the relationship of pension insurance on consumption by using official data from the NBDS of China and applying OLS regression models. The data

show that pension insurance increases people's savings, and therefore inhibits consumption to a certain extent. While the aging process in China is increasing, the consumption for pension insurance will only increase in the future. To enhance consumer stimulation and foster economic growth, this paper proposes the following policy recommendations. First, creating tax incentives and enhancing and safeguarding the pension system. The government should appropriately increase the level of pension payments, increase the elderly's degree of financial stability, and make people feel 'secure in their old age', reduce the psychology of large savings, and improve disposable income. At the same time, the pension adjustment mechanism should be optimized so that it can follow the economic changes of the times. According to the price index and consumption index timely adjustment of the amount of pension, to ensure that the elderly can maintain a certain purchasing power, increase the sense of financial security and consumer confidence of the elderly, so as to promote the growth of consumption capacity. Second, optimizing the pension insurance mechanism and providing tax incentives for individuals or enterprises to alleviate the pressure of purchasing insurance. Using more flexible tax policy, promote insurance companies to carry out specialized pension insurance business, in-depth research in this field, at the same time under certain circumstances can increase tax incentives to ensure that insurance companies in the field of old age pension can be the long-term development, in the construction of the economy to play a greater role.

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