Does China's new rural pension insurance reduce household saving?

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Abstract

This paper uses CFPS data to study the impact of China's new rural insurance policy on the rural savings rate. After establishing OLS and add year and county fixed effects, we then use instrumental variables to solve endogenous problems. We find that the new rural insurance has no significant impact on the savings rate of insured residents.

Keywords: saving ratio, rural insurance, fixed effects, OLS, 2SLS

1   Introduction

China is known for its high saving rate. According to the data from world bank, china's gross saving rate was 43.82%, ranked at top 5 all over the world in 2019. Looking at the trend of china's saving rate for recent years, however, we found that the absolute value was declining. The peak was in 2008, reached 51.79%, and then gradually dropped to 43.82% in 2019. While we check the world's trend, it just fluctuated for the same time period, indicating that saving rate declining in not the world trend. So, we are interested in how china's saving rate declining happened.

A general explanation for high saving rate is the underdevelopment of social welfare system. Family needs to save money for the future expense of after retirement life and medical care (Meng 2003; Chamon and Prasad 2010). High saving rate means low current expense, which is not good for economic development. Chinese government has been improving its social welfare system for recent decade, one of its measure is the new type of pension insurance for rural residents (Chinese household registration system divide people into urban residents or rural residents, different type of resident has different management system), we call it new type of rural pension insurance (NTRPI) for short. This measure was issued and started experiment in 2009, promoted to every county in China in 2012.

Our general question is: does the new type of rural pension insurance effect the saving rate of rural family in China? In this paper, we are going to answer the above question and support our answer by empirical evidence. First, we are going to extract and clean the raw data from CFPS dataset, and then we are going to do some descriptive statistics to demonstrate the overall distribution of our data.

Next, we are going to establish a linear regression model to test the effect of new type rural pension insurance's effect on saving rate of rural family in China. Our data is mainly from CFPS (China Family Panel Study), a questionnaire dataset about Chinese household basic information. The dataset covered about 15,000 family from 25 provinces, ranging from 2010 to 2018. In this dataset, it has the information of if one family participate in the

new type rural pension insurance, family yearly income and consumption, from which we can calculate saving rate for each family. Besides the dependent variable (family saving rate) and main independent variable (if participate in new type rural pension insurance), we also have control variables from the dataset, e.g., family size, education status etc. We will also add year fixed effect and county fixed effect to our model.

The potential identification problem for our model is that our main independent variable (if participate in new type rural pension insurance) may be correlated with error term (some unmeasurable family characteristic) i.e., endogeneity problem may occur. Our solution is to use instrumental variable. The instrumental variable we select is whether the community the family locate have already carried out new type rural pension insurance, since this variable is uncorrelated with the family characteristic, and has strong correlation with whether one member of the family participates in new type rural pension insurance.

We use China Family Tracking Survey (CFPS) data to examine the impact of the new rural insurance on household savings and consumption. The data we use are from 2012, 2014, and 2016, just before and after the new agricultural insurance pilot, using this panel data can control the fixed factors of households that do not change over time, and we have further used the instrumental variable method to solve the problem of farmers' participation guaranteed self-selection problem. We find that the new rural insurance has no significant impact on the savings rate of insured residents.

2   Literature Review

Before the New Rural Insurance, China's pension insurance was mainly the basic pension insurance for urban employees. The current research on pension insurance's impact on household savings based on Chinese data has focused on this. Lixin and Sato 2008 and Feng, He, and H. Sato 2011 examined the impact of China's annual pension insurance reform for urban employees. They found that the reduction in net pension wealth

brought about by this reform significantly increased household savings. Bai and Ye 2012 used urban household data from 2002 to 2009 and found that although participation in urban pension insurance will increase consumption, given the conditions of participation in insurance, the increase in contributions will reduce household consumption. They explained that households are facing credit constraints, and there is a motivation to save. After pension contributions increase, people can only reduce the current period to achieve their savings goals consumption. After the implementation of the New Rural Insurance, some studies have begun to evaluate its policy effects. Chen and Yi 2013 and Lingguo Cheng and Zhibiao 2013 used two rounds of CLHLS panel data in 2008, 2011, and 2012 to examine the impact of receiving the new agricultural pension on elderly care model. They found that the new agricultural insurance reduced the senior people's financial resources and dependence on their children and increased the probability that the elderly live separately. Nevertheless, they did not examine the impact of the new rural insurance on household savings.

As for the impact of health insurance on residents' consumption, the existing research conclusions are inconsistent. There is a strand of research holding opinions that health insurance exerts a pull effect on individual consumption since the insurance compensates the individual medical expenses, reduces the uncertainty of individual's medical expenses, and thereby reduces the precautionary savings and increases the individual consumption. (Arrow 1978; Gruber and Yelowitz 1999; Gertler and Gruber 2002; Chou, Liu, and Huang 2004; Wagstaff and Pradhan 2005) Another point of view is that health insurance does not significantly affect consumption; however, there is a positive correlation with precautionary savings. (Starr-McCluer 1996; Kong, 2007) In recent years, with graduate establishment and improvement of China's health insurance system, research in this field has drawn great attention. Existing studies have shown that health insurance reduces the uncertainty of future expenditure, reduces precautionary household savings, and thereby incentivize household consumption, which provides significant policy implications to China's dilemma of weak effective demand. Currently, few articles have

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investigated health insurance's impact, and we aim to offer new insights and policy implications on this urgent issue.

3   Empirical Strategy

Our data is primarily from china family panel studies (CFPS). CFPS data is collected by surveying and tracking families' information all over china mainland, conducted by Peking University, Institute of Social Science Survey. It starts from 2010 to 2018, covers about 15000 families in 25 provinces, which can represent over 95% population of china. The data mainly has three levels: community, family and individual (adults and child). The community level data includes basic information of the covered community, like location, population, average income etc. the family level data includes information of surveyed family, like family size, family members, family overall income and expense, family total asset, etc. the individual level data is separate into two parts: adult and child, includes information about individual's basic information like birthday, education, health condition, career information, financial condition, social welfare, personality etc. We focus on the dataset in 2012, 2014 and 2016, since after 2012 individual level data start to include new type of rural pension insurance information.

We extract family overall income and expense, family saving, family total asset, family size, hukou type (rural or citizen) from family level dataset, whether participate in new type rural pension insurance, adult health condition self-evaluation, child health condition self-evaluation, if adult is in hospital and if child is in hospital from individual level dataset. To be specific, whether one individual participate in new type of rural pension insurance can be separate into two condition: the first one is that the individual participate into new type of rural pension insurance but have not started receiving the pension; the other one is that the individual participate into new type of rural pension insurance and have already started receiving the pension. Basically, the first condition is for those who under 60 (have not retired), and the second condition is for those who over 60 (have

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retired). However, there are some few exceptions, which may be caused by error information (the interviewee gave the wrong answer, or the interviewer made a wrong record) or some policy issue. So, there are two variables about new type of rural pension insurance, the first one indicates whether participate but not receive, and the second one indicates whether participate and receive.

After extracting needed column from the raw data, we then processed the data we selected. Since the raw data comes from different level dataset, we need to combine different level data table into one data table. And since different year's data comes from different table, we also need to stack data from different year to make it one big table. Finally, we need to filter the data to ensure that the data we use in the regression model is clear (i.e., the family exits in both three years).

First, we need to merge the data from family level with data from individual level. We achieved it by collapsing the individual level data int family level data. We denote one variable called if_nrspi_1 as whether any family number participate in new type of rural pension insurance but have not started receiving pension, and another variable called if_nrspi_2 as whether any family number participate in new type of rural pension insurance and have already started receiving pension. Unlike in individual level data, where the above two variables cannot be true at the same time for one person, in family level data, if_nrspi_2 and if_nrspi_2 can be true at the same time for one family, which probably indicate that this family have a people who haven't retired and a retired people that participate in new type of rural pension insurance. The merge the collapsed individual level data with family level data by fid, a family level identification index.

Then, we stack the three years data into one big table. There are two issues. The first one is that we need to use the same set of family level identification index for three years. Fortunately, in the dataset, it records the set of identification index used in 2012($fid12$) for all years. The second issue is that we need to filter the family that have been tracked for all three years. There are some families that derive from the other family (for example, the daughter of one family married a guy, and build a new family) may have the same

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$fid12$ as the original family, but we need to exclude it since it is a new family and have no record in previous year. After filtering, we keep 4116 observations (1372 observations per year).

From the data we processed, we can calculate the saving rate, which defined as (total family income – total family expense)/total family income. We also design a log consumption rate variable, which defined as log(total family expense/total family expense), to conduct robustness test. Notice that saving rate is negatively correlated with consumption rate.

After

3.1   Model Settings

We use the panel data two-way fixed effects model to examine the impact of the implementation of the new rural insurance on the savings rate of Chinese rural households. The specific model is as follows:

$$\text{SavingRatio}_{it} = \beta_0 + \beta_1 * NRP_{it} + \beta_2 * X_{it} + \theta_i + \mu_t + \varepsilon_{it}$$

where NRP_{it} represents the participation of the i-th family in the new rural insurance in the t year. X_{it} represents the relevant control variable of family i that changes with time, and θ_i represents the family fixed effect, which controls the inherent factors of the family that do not change with time. μ_t represents the year fixed effect.

3.2   Endogeneity

The new rural insurance is not implemented all at the same time across the country, but is piloted in batches and continuously promoted in various places. Because the new rural insurance payment is based on the principle of voluntary participation. Among residents under the age of 60, quite a few did not choose to participate in insurance. The new rural insurance participation behavior may be related to some unobservable characteristics of

the family, so the key variable "whether the farmer participates in the insurance" in the regression model (1) is endogenous. Although controlling household fixed effects can control the unobservable characteristics of households that do not change with time (such as consumption habits), it cannot completely control the unobservable characteristics of households that change with time. Therefore, the coefficient estimator may still be biased. In order to solve this problem, we define the dummy variable (CNRP) of whether a county has carried out a new agricultural insurance pilot at the time of the survey based on the time when the family's county (district) implements the new agricultural insurance. Instrumental variables. Whether each county launches a new agricultural insurance pilot determines whether farmers will participate in the new agricultural insurance. The time for a county to launch a new agricultural insurance pilot is mainly determined by the central government and has nothing to do with household-level consumption behaviors, so it satisfies the exogenous nature of instrumental variables condition.

In principle, in places where pilot projects have been carried out, elderly people over 60 are eligible to receive pensions. This has nothing to do with whether an individual chooses to participate in insurance, so there is basically no question of self-selection. However, because some regions have implemented a "bundling policy", that is, when only their children are insured, old people can receive basic pensions. Therefore, strictly speaking, there is also endogenousness in the variable that the elderly over 60 years old receive the new agricultural insurance pension. For this reason, we also use whether a county has implemented the new agricultural insurance pilot as its instrumental variable.

In the first column, we used a simple OLS model without adding any fixed effects. The coefficient of whether family members are insured or not is not statistically significant. In the second column, we control for household and year fixed effects. The coefficient of whether family members are insured is positive, but it is still not significant, and the null hypothesis that the coefficient is equal to zero cannot be rejected. This shows that participation in the New Rural Insurance has no significant impact on the household savings rate. In the third column, we used 2SLS method and introduced an instrumental vari-

able, and found that its coefficient is negative, but it is not statistically significant. The results still show that it is still impossible to reject the null hypothesis that participation in the new rural insurance has no effect on the household savings rate. Part of the existing research also found that pension insurance did not reduce residents' savings. The explanations they gave include that families do not only save for the "old age", they have target savings motives, liquidity constraints, and lack of financial knowledge. We believe that under the actual background of China, participating in the new rural insurance payment has no significant impact on the savings rate of residents under 60, which may be due to the following reasons: First, and most importantly, the contributions and expected benefits of the new rural insurance are very low. According to calculations based on the data in the sample, the family's new rural insurance payment accounts for only 0.7% of the average income. Zhang Huachu and Wu Zhongjian (2013) used actuarial methods to calculate the replacement rate of the new agricultural maintenance pension fund was only about 10%. In contrast, the proportion of urban employee pension insurance contributions to wages reached 28% (including 20% of work units and 8% of personal contributions), the minimum base of annual contributions was 2,530 yuan, and the pension replacement rate exceeded 50%. Therefore, compared with the urban employee pension insurance, the new rural insurance has very limited protection functions, and the expected pension wealth it brings is far from meeting future pension needs, and at the same time, it cannot reduce residents' expectations for those after 60. Secondly, young families rarely save for old-age care, but to cope with various income risks before retirement. Although China's medical insurance system is gradually improving, but the income risks faced by families are still relatively high (such as unemployment, etc.). Moreover, for reasons such as building houses or allowing children to receive higher education, Chinese families have a relatively strong target savings motive. When there are liquidity constraints or it is difficult to finance from outside, this kind of savings motivation is stronger. Therefore, the limited old-age security brought by the new rural insurance can hardly alleviate people's savings on these savings goals motivation. Finally, due to the lack of farmers' financial

knowledge and the possibility of inadequate information and publicity, farmers who are still participating in the insurance do not have strong trust in the new rural insurance, and they cannot accurately predict the pension wealth they will receive after the age of 60. The amount, which further restricts the new rural insurance to play a role in promoting consumption. According to Bai Chongen et al. (2011) based on the New Rural Cooperative Medical System and Cai et al. (2014) based on the research of reproductive sow insurance, due to the low level of education of rural residents in China, the insured has insufficient understanding of insurance items and lack of trust will greatly restrict the role of a new social insurance program.

In terms of control variables, the size of the family population has a significant positive relationship with the household savings rate, while the proportion of children in the household has a significant inverse relationship with the household savings rate, but it is not statistically significant. The worse the health of the household head, the lower the savings rate, which may be due to the poor health and higher medical expenditures. In the end, having an adult in the family hospital will significantly reduce the household savings rate by approximately 30%. Household income has a significant positive impact on the savings rate, which is consistent with the law of diminishing marginal propensity to consume. The coefficient of influence of the average income of the village on the household savings rate is negative, but the degree of significance is not high, indicating that the relative income hypothesis of consumption is only partially supported. In the case of controlling the absolute income, the higher the average income of the village, the lower the relative income of the family in the village. The households with lower relative income compare with other neighbors in consumption, so even if their income remains unchanged, An increase in the average income of neighbors will also increase their own consumption (Duesenberry et al. 1949). The family population size and the family savings rate are both significant. The ratio of children in the family has a negative relationship with the household savings rate, but it is not significant. The worse the health of the household head, the lower the savings rate, and the higher the medical expenditures may

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be due to the poor health. Finally, having an adult in the home can significantly reduce the household savings rate by 14%.

4   Conclusion

Relying on the implementation principles of "guarantee basic, wide coverage, flexibility, and sustainability", the new rural insurance has been implemented nationwide in just three years. According to the data at the end of 2013, the number of people participating in the two types of insurance including the new rural insurance and the combined urban residents' pension insurance totaled 498 million (of which 138 million people received pensions), plus the number of people participating in the urban employee pension insurance was 0.322 billion people, raised nationwide, the old insurance has covered 820 million people, which has initially achieved the goal of establishing a social security system covering urban and rural areas, and has established an endowment insurance system covering the world's largest population without precedent.

This article uses the China Family Tracking Survey (CFPS) and panel data from 2012, 2014, and 2016 to examine the impact of the new rural insurance on household savings rate. We found that the new rural insurance did not have a significant impact on the savings rate of insured residents. The main reason is that the majority of residents' new rural insurance payment is only 100 yuan, and their expected pension is too low to reduce the savings rate through wealth substitution and income risk reduction.

These results have strong policy implications. Although the important goal of the implementation of the new rural insurance at the beginning is to enable farmers to provide for their old age, they will dare to consume without worries, but for the vast majority of people who participate in the insurance stage, the new rural insurance payment is low and the protection is strong. Low, it is difficult to provide protection for the risk of pension. Therefore, in order to exert the stimulus effect of the new rural insurance on consumption to a greater extent, it is necessary to encourage people to choose higher

contributions and increase the pension replacement rate of the new rural insurance. On the one hand, fiscal funds can be used to provide a higher amount of personal account subsidies to insured persons who choose a higher payment grade and a longer payment period; Have a deeper understanding of the new rural insurance and a stronger sense of trust in the long-term sustainability of the new rural insurance, which inspires people to actively choose higher payment grades.

Tables

Table 1: Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
saving ratio	3324	-.738	1.888	-9.967	.993
log consumption ratio	3324	.105	.953	-4.953	2.395
savings	3324	18926.977	39341.181	0	700000
total asset	3324	244609.88	406442.76	-279000	11525000
familysize	3324	5.373	1.687	2	15
if nrspi 1	3324	.655	.476	0	1
if nrspi 2	3324	.263	.44	0	1
if health	3324	.982	.132	0	1
if hospital	3324	.244	.429	0	1
childrensize	3324	1.514	.762	1	7
if health child	3324	.998	.039	0	1
if hospital child	3324	.101	.301	0	1
if nrspi by community	3324	.913	.282	0	1
logsavings	2316	8.821	2.311	0	13.459
share child	3324	.291	.12	.077	.75

Table 2: Empirical Regression

	OLS	OLS	2SLS
	Saving Ratio	Saving Ratio	Saving Ratio
if_nrspi_1	.14*	.109	.026
	(.08)	(.188)	(.251)
if_nrspi_2	.089	.062	.057
	(.085)	(.073)	(.105)
logsavings	.066***	.047	.034*
	(.016)	(.032)	(.02)
familysize	.072***	.076	.139***
	(.024)	(.032)	(.044)
share_child	-.89***	-.902	.558
	(.329)	(.448)	(.613)
if_health_child	.985	.975***	1.311
	(.935)	(.08)	(.799)
if_health	.496	.464	.542
	(.359)	(.622)	(.414)
if_hospital_child	-.064	-.052	-.294**
	(.12)	(.041)	(.119)
if_hospital	-.177**	-.185	-.126
	(.086)	(.066)	(.085)
Time Fixed Effects	No	Yes	Yes
Family Fixed Effects	No	Yes	Yes
Observations	4116	4116	4116
R-squared	.008	.008	.38

[1] *Standard errors are in parentheses.*

[2] **** p<.01, ** p<.05, * p<.1*

Figures

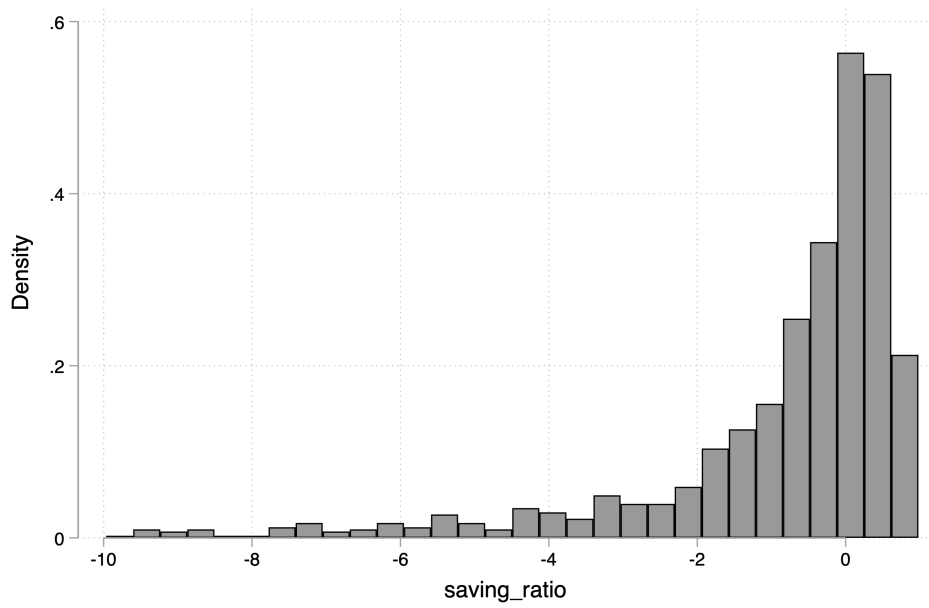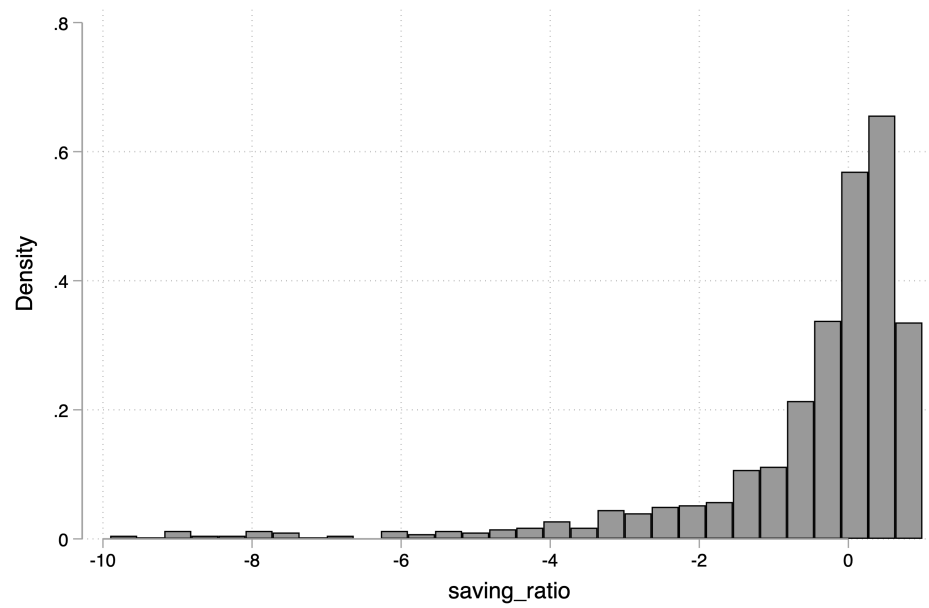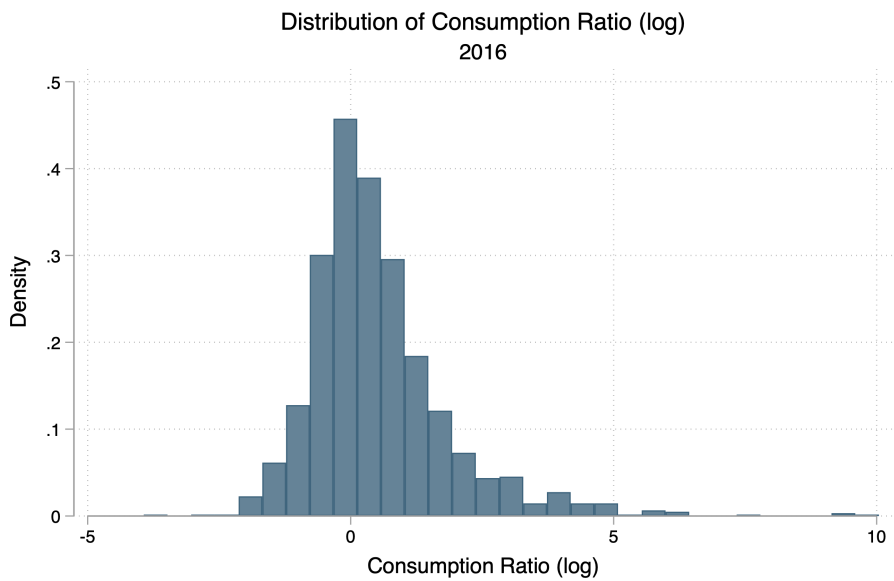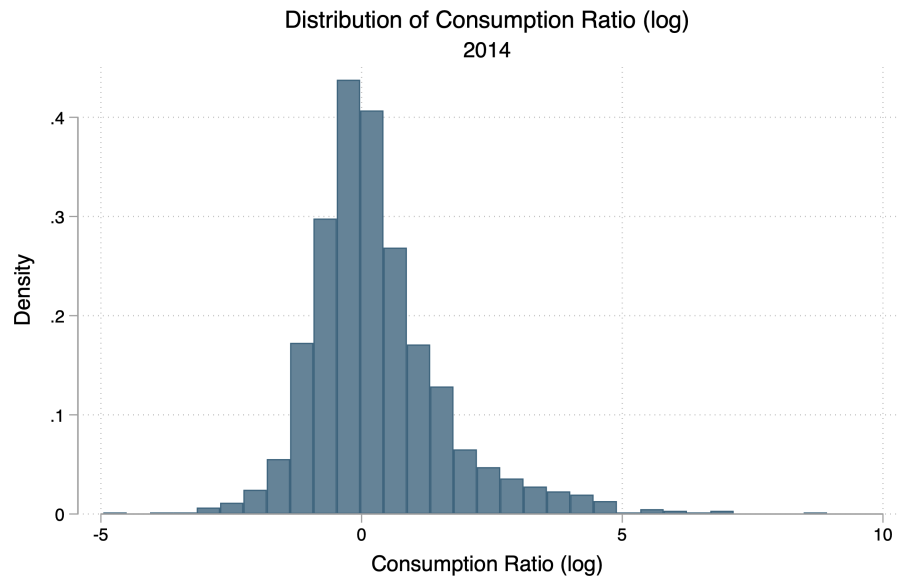Figure 1: Distribution of Saving Ratio in 2014 and 2016

Figure 2: Distribution of Consumption Ratio in 2014 and 2016

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