China's Rising Labor Remuneration and Evolving National Savings Rate

Yang Tianyu (杨天宇)* and Zhu Guang (朱光)
School of Applied Economics, Renmin University of China, Beijing

Abstract: *Cash flow statements suggest that China's rising labor remuneration has had a major impact on its national savings rate since 2008. Accordingly, this paper proposes labor remuneration hypotheses to explain the evolving trend of China's national savings rate. We hypothesize that: (1) The certainty and predictability of household labor remuneration have led to excess sensitivity to consumption, with a corresponding decrease in the household savings rate; (2) rising household labor remuneration means a greater share of labor remuneration is paid by firms, resulting in a smaller corporate savings rate; (3) the increase in the payment of labor remuneration by firms as a share of national disposable income has resulted in the government spending more on social welfare and public services resulting in the government having a declining share of disposable income, less propensity to save, and a falling government savings rate. Using China's provincial panel data of 2008-2016, we performed an empirical test with the minimum wage standard as the instrumental variable to verify the above hypothesis. To cope with economic growth pressures, China needs to shift from an investment-driven to a consumption-driven growth model and prioritize investment efficiency over quantity.*

Keywords: *National savings rate, labor remuneration, evolving trend, cash flow statement*
JEL Classification Code: E21, E24, O16
DOI: 10.19602/j.chinaeconomist.2022.09.04

1. Introduction

Since the implementation of reform and opening-up in 1978, China's national savings rate has trended upwardly, reaching a record high of 51.91% in 2008, far eclipsing the national savings rates of other countries. This upward trend, however, began to show a downward trend in 2008. Based on cash flow statements from the *China Statistical Yearbook*, China's national savings rate dropped from 51.91% in 2008 to 45.96% in 2016. This sharp decrease merits great attention. Although an excessively high national savings rate has multiple adverse effects, the savings rate is not the lower the better. As China's economy is shifting to a new stage of development, a moderate national savings rate is required in order for the government to accumulate adequate financial resources to maintain stable growth, restructure the economy and strengthen weak areas. In the context of China's rising national debt ratio, a high national savings rate acts as a cushion and safety margin. A sharp decrease in the national savings rate makes debt service more difficult and the financial system more fragile, both of which have broad ramifications for China's economic transition. For this reason, it is very important to examine why China's national savings rate—though still somewhat high—has decreased and whether the downward trend is sustainable.

The reason for China's upwardly trending national savings rate prior to 2008 has been extensively

* CONTACT: Yang Tianyu, email: ytianyu@sina.com.
This study is sponsored by the Major Project of the Key Research Base of the Ministry of Education (Grant No.13JJD790036).

analyzed in the literature, but those analyses may not apply to the downward trend in China's national savings rate after 2008—a topic rarely covered in the research literature. Referencing the existing research findings, we further investigate this question. Given the correlated savings behaviors of the government, corporate and household sectors, we posit the hypothesis that rising labor remuneration induces a decline in the national savings rate. According to our hypothesis, China's downward trend in the national savings rate over the past few years has been driven by rising labor remuneration, and, based on consideration of China's shrinking workforce and workers' rising bargaining power, it is the beginning of a long-term trend. In this study, our hypothesis is verified using China's provincial panel data of 2008-2016.

This paper makes the following contributions to the literature. First, for the first time, the reason for China's falling national savings rate is explained from the perspective of the correlated savings behaviors of the government, corporate and household sectors. Second, the labor remuneration hypothesis posited in this paper offers a logically coherent explanation for China's downward trending national savings rate. In comparison, most theoretical hypotheses in the existing literature explain the increase of the national savings rate, and do not present any logical explanation for its downward trajectory. Third, this paper has deepened research on the national savings rate, and identified its determinants and evolving patterns. The theoretical hypothesis and empirical evidence in this study offer a new perspective on and evidence for understanding the evolving trend of China's national savings rate.

2. Literature Review

Chinese and international academics have extensively researched the causes of China's high national savings rate and have made valuable findings. Those studies can be categorized as follows:

(1) Pattern of income distribution: For researchers following this viewpoint, China's high national savings rate can be ascribed to the dominant position of the government and enterprises in national income distribution. Li and Yin (2007) ascribed the rise in China's national savings rate to the increasing savings rates of the corporate and government sectors. Specifically, they held that the rising government savings rate was due to scant welfare spending and hefty public investment, and the rise in the corporate savings rate was due to the shrinking shares of firms' labor remuneration payment and property income. Kuijs (2006) suggested that China's rising national savings rate could be explained by more robust corporate profitability and a greater level of government capital transfers. Xu *et al.* (2010) considered that, motivated by profit-seeking, the Chinese government had invested more heavily in state-owned enterprises (SOEs), which caused the savings rate in the public sector to rise; such direct investment led to crowding out through the performance of public fiscal functions, forcing up the savings rate in the private sector.

(2) Demographic structure: Researchers following this viewpoint consider demographic change to be a cause of the high household savings rate. According to Modigliani and Cao (2004), China's shrinking working-age population and its rising share of non-employed population jointly pushed up its household savings rate in 1953-2000. Yang and Zhang (2013) found that China's pension insurance imperfections and increasing average life expectancy inflamed public concerns over pension sustainability, thus motivating households to save more. Choukhmane *et al*. (2013) found that the lowering level of old-age support expected under the one-child policy could explain 30% of China's rising household savings rate. Imrohoroglu *et al*. (2018) noted that the one-child policy had lowered parents' elderly-care expectations, contributing to the increasing household savings rate.

(3) Imperfections in the economic system: Researchers who hold this viewpoint consider that precautionary household savings will increase due to uncertainties arising from imperfections in educational, pension, healthcare, unemployment and other social protection systems during economic transition (Chamon and Prasad, 2010; Zang and Zhang, 2018). Shen and Xie (2012) uncovered a

significantly positive correlation between uncertain income and the urban household savings rate, as well as the potential of pension and medical insurance participation to sharply reduce the urban household savings rate. With SOEs reform at the end of the 1990s as a natural experiment, He *et al*. (2018) found that the precautionary savings of SOEs employees based on unemployment rate identification relative to the government sector could explain 40% of the increase in the household savings rate. Using the structural lifecycle model, Cooper and Zhu (2017) identified labor market risk as a major cause of the high household savings rate.

(4) Cultural customs: Unlike in Western countries, in traditional Chinese culture, frugality is a virtue, which has led to a propensity to save. However, some studies concluded that the effects of Chinese culture are heterogeneous across various groups of households. Whereas the high-income group needs to maintain a higher savings rate in order to maintain their social status, the low-income group is less inclined to do so. As China's household income rises, more people will join the high-income group, thus causing the savings rate to increase (Yang *et al.*, 2015).

(5) Income inequality: For researchers holding this viewpoint, since the savings rate of high-income households is higher than the saving rates of middle- and low-income households, the total household savings rate will increase with the widening of the household income gaps (Chen, 2012; Gan *et al.*, 2018). In further developing this theory, some studies considered that such Chinese-style targeted consumption had increased the propensity of middle- and low-income people to save, magnifying income inequality's effect of causing the savings rate to rise (Wang and Guo, 2011).

These studies have a certain explanatory power for the rise of the savings rates, but are problematic in explaining the decrease. China's savings rate has been falling since 2008. Since no literature suggests that any change has occurred in China's cultural customs, uncertainties facing households and increasing average life expectancy over the past decade, none of the theories of cultural customs, imperfections in the economic system and demographic structure offers any convincing explanation for China's falling savings rate. By the logic of income inequality, the savings rate should increase in tandem with income growth, and for two groups with similar income levels, their savings rates should be close to each other. Yet data from the *China Statistical Yearbook* suggest that the savings rate of rural households remained roughly unchanged in spite of farmers' rising income in 2008-2016. Despite the narrowing urban-rural income gap during the same period, China's urban-rural savings rate gap widened from seven percentage points to 13 percentage points. Income inequality offers little explanation for this discrepancy.

Data from cash flow statements indicate there was a reduction in China's national savings rate by 5.95 percentage points in 2008-2016, to which the decrease in the household savings rate contributed a mere 0.83 percentage points. Since demographic structure, imperfections in the economic system, cultural customs, and income inequality are all concerned with the household savings rate, they explain only a fraction of the change in China's national savings rate, even if all of them hold true. The theory of the pattern of income distribution is concerned with the savings rates of the government, corporate and household sectors and therefore this theory is more convincing. Yet existing studies on the pattern of income distribution appear to have limited explanatory power for the downward trend of China's savings rates. According to data from cash flow statements of 2008-2016, government investment and government capital transfer both increased as a share of national disposable income. Contrary to the logic of the income distribution theory, i.e. the government savings rate should keep rising, the government savings rate has in fact declined. In 2008-2016, the government savings rate fell from 5.89% to 3.50%, and the public sector savings rate dropped from 9.60% to 6.60%. Labor remuneration paid by firms and property income as a share of national disposable income took an upward turn after 2008, but the reason for this reversal and the effects on the savings rates cannot be found in the existing literature.

This paper attempts to explain the downward trend of China's national savings rate since 2008 from the perspective of rising labor remuneration. Based on China's changing labor market and correlated changes in savings behaviors of the household, corporate and government sectors, this paper puts forth

a labor remuneration hypothesis for the evolving trend of China's national savings rate, and based on an analysis of the effects of labor market changes on government, corporate and household savings, concludes that China's falling national savings rate in recent years stemmed primarily from rising labor remuneration.

3. Labor Remuneration Hypothesis for China's Declining National Savings Rate

3.1 Stylized Facts of China's Falling National Savings Rate since 2008

As the object of research in this paper, the national savings rate is the ratio between total national savings and total disposable income. As an aggregate concept, total savings include savings of the household, corporate - including financial and non-financial - and government sectors. We define sectoral savings rate s_i as the savings of sector S_i divided by gross domestic disposable income Y, i.e. $s_i = S_i/Y$, where i denotes the household, corporate and government sectors. Savings of the household and government sectors equal the disposable income of those sectors minus final consumption. No consumption spending occurs in the corporate sector, whose savings equal its disposable income.

According to data of the cash flow statement, China's national savings rate decreased after reaching a peak around 2008, and a similar trend occurred in the household, corporate and government savings rates. For a more explicit revelation of the reasons behind China's falling sectoral savings rates, we decompose sectoral savings rates into the product between the propensities of various sectors to save (S_i/Y_i) and the share of sectoral disposable income (Y_i/Y), i.e. $s_i = S_i/Y_i \times Y_i/Y$.

As can be seen from the results of sectoral savings rate decomposition shown in Table 1, China's falling household savings rate is attributable to the falling household propensity to save, since the share of household disposable income increased after 2008. The shares of corporate and government disposable incomes and the government propensity to save both decreased after 2008. That is to say, decreasing household propensity to save, the shrinking share of corporate disposable income and the decreases in both the share of government disposable income and propensity to save all led to a decrease in China's national savings rate during 2008-2016.

Table 1: Results of Sectoral Savings Rate Decomposition

Year	Household sector		Corporate sector	Government sector	
	Propensity to save (%)	Share of disposable income (%)	Share of disposable income (%)	Propensity to save (%)	Share of disposable income (%)
2008	39.94	58.28	22.74	31.04	18.98
2009	40.38	60.53	21.19	27.02	18.28
2010	42.10	60.40	21.19	28.01	18.41
2011	40.88	60.78	20.03	29.99	19.19
2012	40.70	61.99	18.47	29.51	19.54
2013	38.46	61.29	19.77	26.39	18.94
2014	37.99	60.65	20.50	29.45	18.85
2015	37.07	61.64	19.81	24.29	18.55
2016	36.14	62.10	20.01	19.57	17.89

Source: Calculated based on data from the cash flow statements.

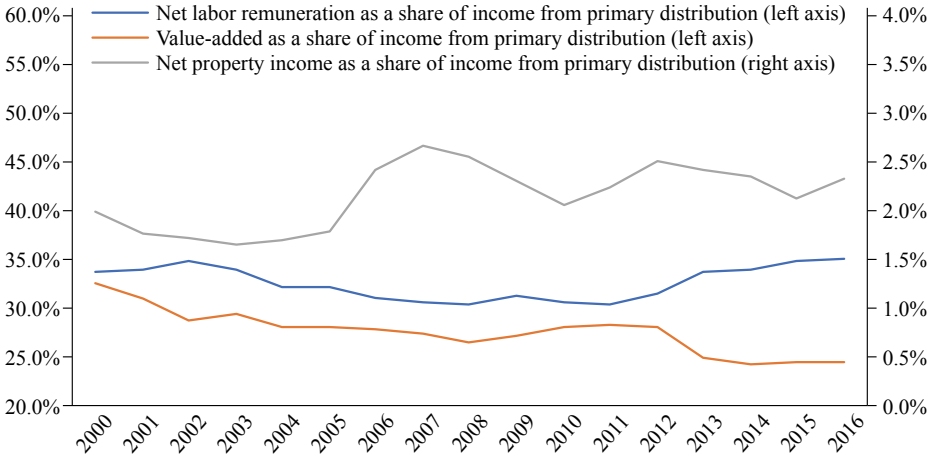

Figure 1: China's Net Household Labor Remuneration, Value-Added and Property Income as a Share of National Income from Primary Distribution in 2000-2016

Source: Calculated based on data from cash flow statements.

3.2 Rising Labor Remuneration and Falling Household Savings Rate

China's rising labor remuneration since 2008 is a notable economic phenomenon. According to data from the *China Statistical Yearbook*, China's workforce grew from 755.64 million to 776.03 million over the period of 2008-2016, up just 2.69%. Figure 1 reveals that China's net household labor remuneration as a share of primary national distribution increased from 30.31% to 35.11%, up 4.80 percentage points. The sharp increase in the share of China's household labor remuneration despite the meagre growth of the workforce meant an increase in per capita labor remuneration. The share of net labor remuneration is the only portion of household income from primary distribution that increased after 2008, and the shares of value-added and property income both decreased.

After 2008, China's net household labor remuneration rose steadily as a share of national disposable income in the context of slowing economic growth, which means that such an increase is not cyclical. This shift was probably due to a change in labor supply and demand. According to Li *et al*. (2009), a diminishing supply of rural surplus labor would induce a rise in the share of labor remuneration. Unless this trend reverses, the increasing share of labor remuneration will be a long-term trend with far-reaching implications for the savings behaviors of the household, corporate and government sectors.

For the household sector, we may explain the relationship between labor remuneration and the household savings rate by excess sensitivity to consumption. As US economist Flavin (1981) found, there is a significantly positive correlation between change in labor income and consumption in the current phase and with a one-phase lag (i.e. previous phase), even if consumption changes arising from the current-phase marginal propensity to consume labor income are excluded. That is to say, consumption is subject to the positive effects of both permanent income and changing labor income. This phenomenon may be referred to as excess sensitivity to the consumption of labor income, which can be explained with the precautionary savings theory, i.e. precautionary savings will increase with the uncertainty of labor income and decrease as the foreseeable change in labor income means less uncertainty.

In China's reality, this means that the household savings rate will decrease as long as a rise in labor remuneration becomes more certain. Driven by a diminishing supply of excess labor and a policy factor, there has been an increasing certainty and predictability in China's rising labor remuneration since 2008. The policy factor has greatly strengthened expectations for rising labor remuneration. The *Labor*

Contract Law that came into force on January 1, 2008 and its amendment that took effect on July 1, 2013 have both greatly enhanced labor protection, forcing firms to raise labor remuneration. Since 2008, many local governments have raised the minimum wage many times, spurring wage growth. Under a confluence of forces from the changing labor supply and demand and the policy factor, increasingly predictable rising labor remuneration has led to a decrease in the savings rate of China's urban and rural households.

3.3 Rising Labor Cost and Falling Corporate Savings Rate

Rising household labor remuneration means a higher labor cost for firms, which lessens the firms' disposable income as a share of national disposable income.

As can be seen from Figure 2, corporate value-added, labor remuneration payment and net property income as a share of national disposable income all increased after 2008, with the sole exception of the net production tax, which decreased. But increases in the shares of labor remuneration paid by firms and net property income by 5.26 and 2.05 percentage points, respectively, far outweigh the decrease in the share of net production tax by 0.54 percentage points. That is to say, the corporate sector's falling savings rate is due to an increase in the labor remuneration paid by firms and the property income of firms. Judging by the changes in those two items, the share of labor remuneration paid by firms is undoubtedly the most important factor. The share of labor remuneration paid by the corporate sector increased at a faster pace (5.26 percentage points) than did the household sector's share of net labor remuneration of (4.80 percentage points) shown in Figure 1. This suggests that the household sector's increasing share of net labor remuneration all derived from firms. Hence, we may draw the conclusion that rising labor remuneration has led both household and corporate savings rates to decline, i.e. the savings behaviors of the household and corporate sectors are correlated.

3.4 Rising Labor Remuneration Caused the Government Savings Rate to Decline

In this paper, we consider the decreases in the government propensity to save and the share of government disposable income as attributable to a rise in labor remuneration. Figure 3 describes the trend of changes in net social security contributions, social relief and ordinary tax as a share of national disposable income.

As can be learned from Figure 3, the share of net social security contributions peaked in 2008 and

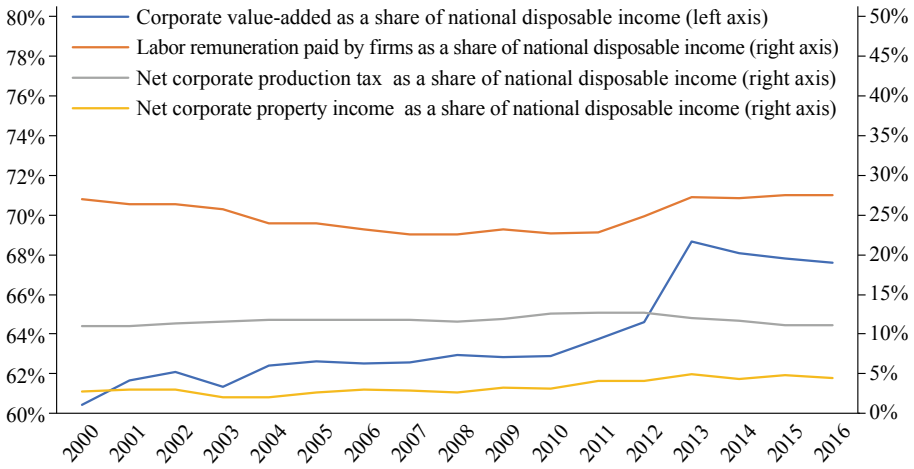

Figure 2: Change in the Sources and Uses of Corporate Funds as a Share of Gross National Disposable Income in 2000-2016

Source: Calculated based on data from the cash flow statements.

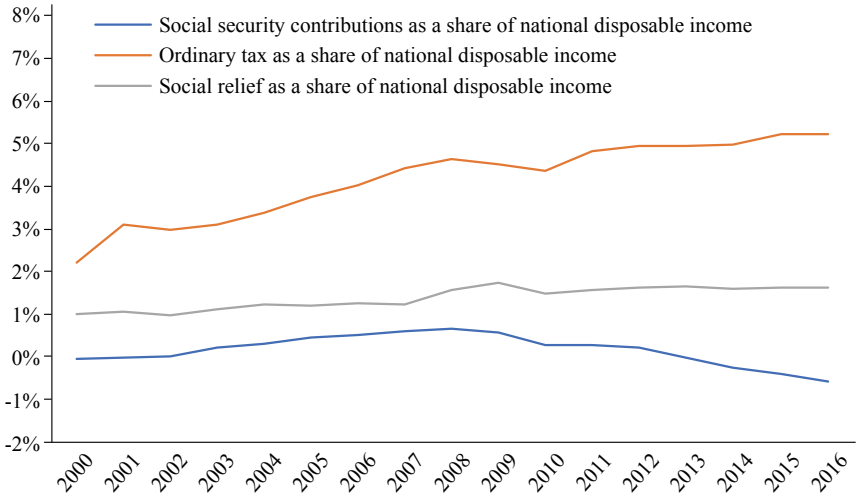

Figure 3: Change in Net Social Security Contributions, Ordinary Tax and Social Relief as a Share of Gross National Disposable Income in 2000-2016

Source: Calculated based on data from the cash flow statements.

began to decrease from then on; the share of social relief slightly increased. The trend of both social security contributions and social relief is likely to have been caused by an increase in labor remuneration paid by firms to households. Since labor remuneration is the base of social insurance benefits (which include, in China's case, pension insurance, medical insurance, unemployment insurance, work injury insurance, birth insurance and the housing provident fund), a wage hike naturally drives down the share of net social security contributions. Constituents of social relief include injury and death compensation, living allowance and social relief (such as the urban subsistence protection program). Among them, the first two need to be multiplied by certain months of salary, but the third, i.e. social relief, is linked with the local minimum wage and will increase if the wage level rises. An increase in firm labor cost will, therefore, decrease the share of government disposable income and thus cause the government savings rate to decline.

Increase in government spending is influenced by rising labor remuneration in three ways. First, an increase in labor remuneration as the base of social security contributions will increase government spending on social security, employment and housing protection. Second, government-procured public services such as education, healthcare, culture, sports, mass media, and technical services employ a large workforce, whose wage increase will raise the cost of those public services. Third, rising household incomes in a mature stage of economic development will be accompanied by a greater consumer demand for more income-elastic services such as education, healthcare, social security and welfare, most of which are government services and contribute to a greater share of public spending (Musgrave, 1969). In all three respects, rising labor remuneration will lead to a decline in the government propensity to save.

3.5 Labor Remuneration Hypothesis of China's Falling National Savings Rate

Based on the above analysis, we put forth the labor remuneration hypotheses of China's falling savings rate.

First, an increase in labor remuneration will simultaneously drive down household and corporate savings rates via the following mechanisms: Rising labor remuneration → excess sensitivity of household consumption → falling household savings rate; Rising labor remuneration →increase in share of labor remuneration paid by corporate→decrease in share of corporate disposable income→falling corporate savings rate. Under this mechanism, we obtain the following hypothesis to be tested.

Hypothesis 1: Rising labor remuneration will cause household and corporate savings rates to fall.

The rising share of labor remuneration paid by firms will lead to a correlation between corporate and government savings behaviors, causing the government savings rate to decline. The transmission mechanisms are twofold: (1) Rising labor remuneration paid by firms → increase in government spending on social welfare and social relief → decreasing share of government disposable income → shrinking government savings rate; (2) rising labor remuneration paid by firms → increase in government spending on public services → decrease in government propensity to save → falling government savings rate. Based on the above transmission mechanisms, we arrive at the following hypothesis to be tested.

Hypothesis 2: Rising labor remuneration will cause the government savings rate to fall.

Since the national savings rate is the sum of household, corporate and government savings rates, based on Hypotheses 1 and 2, we may arrive at Hypothesis 3.

Hypothesis 3: Rising labor remuneration will cause the national savings rate to decline.

The above three hypotheses suggest that the decreasing national savings rate has resulted from correlated household, corporate and government savings rates rather than the aggregation of coincidental and uncorrelated decreasing savings rates in a few sectors.

Notably, before 2008, China's labor remuneration increased slowly, but a change occurred in 2008. Li and Yin (2007) found that household labor remuneration and labor remuneration paid by firms as a share of national disposable income both decreased in 1992-2003. As shown in Figures 1 and 2, the downward trends of those two indicators persisted into 2007. Since 2008, however, household labor remuneration and labor remuneration paid by firms both increased. That is to say, China's labor remuneration growth after 2008 is not just an increase of the wage index, it is also an increase relative to national disposable income. According to its transmission mechanism, Hypothesis 1 will hold true only when the household labor remuneration and the labor remuneration paid by firms both increase as a share of national disposable income, which is an essential condition for rising labor remuneration to influence the national savings rate via the above transmission mechanism. Such condition, however, was absent before 2008, rendering the transmission mechanism in Hypothesis 1 ineffective. At this moment, rising labor remuneration logically cannot influence change in the national savings rate.

4. Empirical Test of the Labor Remuneration Hypotheses of China's Falling National Savings Rate

4.1 Estimation Method

Consistent with the time period of the falling savings rate, this paper employs the panel data of the sample 30 provincial jurisdictions from 2008 to 2016 to test the above hypotheses, focusing on the effects of changing labor remuneration on sectoral and aggregate savings rates. In this paper, we specify the following three benchmark econometric regression models:

$$HESR_{it} = \alpha_0 + \alpha_1 L_{it} + \alpha_i X_{it} + \lambda_i + e_{it} \quad (1)$$

$$GOVSR_{it} = \beta_0 + \beta_1 L_{it} + \beta_i Y_{it} + \theta_i + \mu_{it} \quad (2)$$

$$NATSR_{it} = \gamma_0 + \gamma_1 L_{it} + \gamma_i Z_{it} + \psi_i + v_{it} \quad (3)$$

Where, subscript i is the province, and t is the sample year. *HESR* is the sum of corporate and household savings rates, *GOVSR* is the government savings rate, *NATSR* is the gross national savings rate, L is per capita labor remuneration in the household sector, X, Y and Z are vectors of control variables in Model (1), (2) and (3). λ_i, θ_i and φ_i are the individual fixed effects of province that control for regional effects that do not change with individual provinces, e.g. the effects of location, economic development and other factors of various provinces on their savings rates; e_{it}, μ_{it} and v_{it} are residual errors. To be consistent with the hypotheses posited in this paper, China's falling government, corporate and household savings rates can be ascribed to rising labor remuneration, i.e. α_1, β_1 and γ_1 should be significantly negative.

The main problem of the above econometric equation is that the main explanatory variables such as per capita labor remuneration are endogenous variables prone to the endogeneity problem due to the omission of variables, measurement errors, two-way causality and sample selection bias. We address this problem with the IV-2SLS method. The key to this method is to identify a suitable IV, i.e. the instrumental variable of per capita labor remuneration. We used the minimum wage of each province as the instrumental variable of per capita labor remuneration. Despite a certain policy externality, the minimum wage may also be subject to the impact of some economic and social factors. Referencing Chodorow-Reich and Wieland (2016) and Zhou *et al.* (2018), we created an exogenous instrumental variable for minimum wage. Specifically, the growth rate of the average local minimum wage in all regions, except the region in question, is employed to calculate the exogenous minimum wage growth for the region in question. Then, the instrumental variable value of the region's minimum wage is obtained with the initial value of the region's exogenous minimum wage.

4.2 Indicator and Data Explanations

This paper employs economic data of the sample 30 provincial jurisdictions, excluding Tibet due to missing data, in 2008-2016 for a test of the labor remuneration hypotheses. Unless otherwise specified, all data are from the *China Statistical Yearbook* for various years.

(1) Savings rate. Due to the lack of cash flow statements for various provinces, we adopt the method recommended by Xu *et al.* (2010). The sum of corporate and household savings rates is referred to as "non-governmental savings rates," which are calculated by the difference between the national savings rate and the government savings rate. Specifically, the national savings rate is (GDP—final consumption) / GDP, and the government savings rate is (gross local government revenue—government transfer spending—government consumption) / GDP of each province.

(2) Labor remuneration. We adopt GDP data using the provincial income approach to calculate the labor remuneration of each province. GDP by the provincial income approach consists of four parts, including labor remuneration, fixed asset depreciation, net production tax and business surplus. We define the labor remuneration / urban and rural employment of each province as per capita labor remuneration. The urban-rural employment data of Hebei Province are from *Hebei Economic Yearbook*, and those of Gansu Province are from *Gansu Development Yearbook*. Data of other provinces are from their respective statistical yearbooks.

(3) Other control variables. This paper specifies the following control variables: Government investment rate (distribution pattern theory), child and dependency ratio, old-age dependency ratio and gender ratio (demographic structure theory), per capita educational and medical spending (theory of imperfections in the economic system), and urban-rural income gaps (income inequality theory and cultural customs theory). Among them, the cultural customs theory is denoted by urban and rural income gaps because income gaps are a key factor influencing rural consumer habits. Considering the differences in the consumption behaviors of urban and rural households, this paper has also controlled for the share of urban population. Given the status of existing research, this paper has introduced SOEs profitability data from the *China Accounting Yearbook* and controlled for the impact of the interest rate in all tests. In addition, we have deflated variables measured by price such as per capita labor remuneration, per capita educational spending, and per capita medical spending according to the CPI of each province.

4.3 Analysis of Econometric Results

To examine the impact of rising labor remuneration on the savings rate, we first employ minimum wage as an instrumental variable for an estimation of equations (1)-(3). Table 2 lists the estimated results with provincial per capita labor remuneration as the independent variable.

Table 2 reports the first-stage F-value and the second-stage regression results. Columns (1) and (2) list minimum wage as an instrumental variable, and the explained variable is the sum of the corporate

and household savings rates. Column (2) is the regression results after deleting the most insignificant indicators. Judging by the regression results, the coefficient of per capita labor remuneration is significantly negative at the 5% level, which is consistent with the expectations of Hypothesis 1. In addition, we also find that many popular theories are not supported by econometric results. Specifically, the econometric results of the child dependency ratio, the elderly dependency ratio, the gender ratio, the urban-rural income gap, the interest rate and the share of urban population are all insignificant. Such results refute the theories that demographic structure, income inequality and cultural customs influence non-governmental savings. However, the test results of per capita educational spending and medical spending are significant at the 5% and 10% levels, respectively, which indicates that the theory of imperfections in the economic system has a certain explanatory power for the non-governmental savings rate.

Table 2: IV-2SLS Regression Results of per Capita Labor Remuneration and Savings Rate (with minimum wage as the instrumental variable)

	(1) Non-government savings rate	(2) Non-government savings rate	(3) Government savings rate	(4) National savings rate	(5) National savings rate
Per capita labor remuneration	-0.1173**	-0.0773***	-0.5905***	-2.2720**	-1.8165**
	(0.0573)	(0.0276)	(0.1923)	(0.9564)	(0.7238)
Old-age dependency ratio	-0.0000			0.1812	
	(0.0059)			(0.1306)	
Child dependency ratio	-0.0029			-0.1128	
	(0.0091)			(0.1764)	
Gender ratio	-0.0041			-0.0299	
	(0.0149)			(0.2959)	
Per capita educational spending	0.0321**	0.0299***		0.5913**	0.5451***
	(0.0162)	(0.0100)		(0.2741)	(0.2113)
Per capita medical spending	0.0175*	0.0122*		0.3047*	0.2161*
	(0.0094)	(0.0064)		(0.1557)	(0.1266)
Urban-rural income gaps	-0.0077			-0.2593	
	(0.0120)			(0.2173)	
Interest rate	0.0041		-0.0478	0.0749	
	(0.0025)		(0.0303)	(0.0466)	
Share of urban population	0.0718		0.1728	1.5909*	1.4137**
	(0.0463)		(0.4728)	(0.8692)	(0.6833)
Government investment rate			1.0832***	0.3917*	0.3903**
			(0.0930)	(0.2366)	(0.1831)
SOEs profitability			-0.2464*	0.5747***	0.4574***
			(0.1334)	(0.2141)	(0.1545)
Constant term	2.6832***	2.5551***	-42.1441***	-9.3518	2.9277
	(0.1663)	(0.0797)	(15.4236)	(9.5386)	(1.8021)
Provincial fixed effect	Controlled	Controlled	Controlled	Controlled	Controlled
First-stage F value	4.6217	11.3651	82.9910	5.9814	8.2766
Observations	270	270	270	270	270
R^2	0.1768	0.5275	0.9077		0.2377

Note: Numbers in parentheses are robust standard errors; *, ** and *** denote significance at 10%, 5% and 1%, respectively.

Column (3) lists the minimum wage as the instrumental variable and the government savings rate as the explained variable. Except for the theory of income distribution, none of the other theories took the government savings rate as an object of explanation. As a result, Column (3) only lists the estimated results of per capita labor remuneration, the government investment rate, SOEs profitability, the share of urban population, and the interest rate. Judging by the results, the coefficient of per capita labor remuneration is significantly negative at the 1% level, which is consistent with the expectations of Hypothesis 2. We also find that the coefficient of the government investment rate is significantly positive at the 1% level, which is consistent with the expectations of the trends of the government investment rate and savings rate in the literature. This explains that after 2008, the government investment rate could still increase the government savings rate, but the effect was offset by the reduction of the government savings rate due to rising per capita labor remuneration.

Columns (4) and (5) employ minimum wage as the instrumental variable, and the explained variable is the national savings rate. Column (5) is the regression results after deleting the most insignificant indicators. As can be learned from the regression results, the coefficient of per capita labor remuneration is significantly negative at the 5% level. After removing insignificant variables, it remains significantly negative at the 5% level, which is consistent with Hypothesis 3, i.e. rising labor remuneration helps reduce the national savings rate.

In a word, the labor remuneration hypotheses posited in this paper, together with the theory of imperfections in the economic system and the theory of distribution pattern in the existing literature, all have a certain explanatory power for change in the savings rate. Based on the above econometric results, we find that since 2008, some changes have occurred in the determinants of the household and corporate savings rates, the government savings rate and the national savings rate. A prominent manifestation is that many variables mentioned in the existing literature lack explanatory power for new changes in the savings rate. Many variables with explanatory power, however, are still significantly positively correlated with the savings rate, which is consistent with the expectations of various theories, but such positive correlation is insufficient to raise the savings rate.

For instance, the coefficient of the government investment rate is significantly positive, which suggests that the distribution pattern still has an explanatory power for the savings rate, but this factor alone is not enough to cause the national savings rate to rise. On the contrary, rising per capita labor remuneration has a significantly negative effect on the household, corporate and national savings rates. Judging by results from changes in the savings rate, rising labor remuneration has offset the positive effects of other factors on the savings rate, which suggests that the hypotheses of labor remuneration have a great deal of explanatory power for the decrease of various savings rates.

5. Concluding Remarks and Policy Implications

Based on data from cash flow statements of 2008-2016, this paper puts forth labor remuneration hypotheses to explain China's decreasing national savings rate, and employs China's provincial panel data of 2008-2016 for verification. Our study found that the increase in per capita labor remuneration has led to correlated decreases in household, corporate and government savings rates and thus has caused China's national savings rate to decrease. This finding offers a coherent explanation for China's decreasing sectoral and aggregate savings rates since 2008.

The labor remuneration hypotheses put forth in this paper also explain the decrease in savings rates from the perspective of the national income distribution pattern. Unlike the traditional theory of the income distribution pattern, however, this paper explains change in China's national savings rate from the perspective of rising labor remuneration rather than from the level of government investment. This paper considers that the negative effect of rising labor remuneration on the national savings rate has

offset the positive effects of other factors on the national savings rate, thus dominating the downward trend of the national savings rate.

Since changes in China's labor market are characterized by the decreasing supply of surplus labor and the increasing bargaining power of labor versus capital, following this paper's logic, the decline in China's national savings rate is sustainable. This will have a major impact on China's macroeconomic policymaking. As a developing country, China needs to maintain fairly high economic growth and investment rates to meet various economic and social objectives. A decrease in the national savings rate without a corresponding increase in the investment rate will lead to a negative savings-investment gap. According to the international balance of payments, this negative gap will bring about sustained trade deficits and rather serious financial risks. To avoid such consequences, we consider it necessary to adjust policymaking to stabilize economic growth.

First, economic growth should be driven primarily by consumption rather than investment. Given the decreasing national savings rate, we should avoid resorting to another mass investment stimulus to spur economic growth. The flip side of China's falling savings rate is its increasing consumption rate, which makes the case for promoting consumption as a growth driver. In particular, attention should be given to the economic growth and the industrial sophistication effects of medium- and high-end consumption by the middle-income group. This requires the government to utilize public finance functions and continue increasing spending on higher education, healthcare and social protection to make households less scrupulous and cash-strapped when making consumption decisions.

Second, pro-growth policies should focus on investment efficiency rather than quantity. More efficient investments may lead to a desirable economic growth rate with a modest investment rate. One way for China to deal with a declining investment rate is to raise investment efficiency, one place where it falls far behind developed countries. For instance, it may reduce taxes and fees to cut firm costs, reward firms' technology progress to increase capital productivity, improve capital markets, and reduce corporate financing cost. GE

References:

[1] Chamon, Marcos D., and Eswar S. Prasad. 2010. "Why Are Saving Rates of Urban Households in China Rising?" *American Economic Journal: Macroeconomics*, 2(1): 93-130.

[2] Chen, Binkai. 2012. "Income Inequality and Consumption Demand: Theory and Evidence from China." *Nankai Economic Studies*, 1: 33-49.

[3] Chodorow-Reich, Gabriel, and Johannes Wieland. 2016. "Secular Labor Reallocation and Business Cycles." *NBER Working Paper*, no. 21864.

[4] Choukhmane, Taha, Nicolas Coeurdacier, and Keyu Jin. 2013. "The One-child Policy and Household Savings." *CEPR Discussion Paper*, No. DP9688.

[5] Cooper, Russell, and Guozhong Zhu. 2017. "Household Finance in China." *NBER Working Paper*, No. 23741.

[6] Flavin, Marjorie A. 1981. "The Adjustment of Consumption to Changing Expectations about Future Income." *Journal of Political Economy*, 89(5): 974-1009.

[7] Gan, Li, Naibao Zhao, and Yongzhi Sun. 2018. "Income Inequality, Liquidity Constraints and China's Household Savings Rate." *Economic Research Journal*, 53(12):34-50.

[8] He, Hui, Feng Huang, Zheng Liu, and Dongming Zhu. 2018. "Breaking the 'Iron Rice Bowl': Evidence of Precautionary Savings from the Chinese State-owned Enterprises Reform." *Journal of Monetary Economics*, 94(1): 94-113.

[9] Imrohoroglu, Ayse, and Kai Zhao. 2018. "The Chinese Saving Rate: Long-Term Care Risks, Family Insurance, and Demographics." *Journal of Monetary Economics*, 96(3):33-52.

[10] Kuijs, Louis. 2006. "How Will China's Saving-Investment Balance Evolve?" *Policy Research Working Paper*, No.5.

[11] Li, Daokui, Linlin Liu, and Hongling Wang. 2009. "The U Curve of Labor Share in GDP during Economic Development." *Economic Research Journal*, 44(1):70-82.

[12] Li, Yang, and Jianfeng Yin. 2007. "Anatomy of High Saving Rate of China: Analysis Based upon Flow of Funds Account of China from 1992 to 2003." *Economic Research Journal*, 42(6): 14-26.

[13] Modigliani, Franco, and Shi Larry Cao. 2004. "The Chinese Saving Puzzle and the Life-cycle Hypothesis." *Journal of Economic Literature*, 42(1): 145-170.

[14] Musgrave, Richard Abel. 1969. *Fiscal Systems*. New Haven: Yale University Press.

[15] Shen, Kunrong, and Yong Xie. 2012. "Empirical Study on Correlation between Uncertainties and China's Urban Household Savings Rate." *Journal of Financial Research*, 3:1-13.

[16] Wang, Wei, and Xinqiang Guo.2011. "Income Inequality and China's High Savings Rate: a Theoretical and Empirical Study based on the Perspective of Targeted Consumption." *Management World*, 9:7-25.

[17] Xu, Zhong, Xuechun Zhang, Zhijie Ding, and Tian Tang. 2010. "Public Finance and the High Savings Rate in China." *Social Science in China*, 6: 93-107.

[18] Yang, Jijun, and Erzhen Zhang. 2013. "The Effects of the Age Structure of population and the Old-age Insurance System Transition on Residents' Savings Rates." *Social Science in China*, 8: 47-66.

[19] Yang, Panpan, Guangrong Ma, and Jianwei Xu. 2015. "Demystifying China's Increasing Current Account Surplus in 2002-2008." *The Journal of World Economy*, 38(2):112-139.

[20] Zang, Xuheng, and Xin Zhang. 2018. "Household Asset Allocation and Heterogeneous Consumer Behavior in China." *Economic Research Journal*, 53(3):21-34.

[21] Zhou, Mao, Yi Lu, and Yunong Li. 2018. "Regional Industrial Upgrading and Labor Income Share: Estimation from a Synthesized Instrumental Variable." *Economic Research Journal*, 53(11): 132-147.