



OPEN ACCESS

EDITED BY

Valentin Marian Antohi,
Dunarea de Jos University, Romania

REVIEWED BY

Sajid Amin,
Punjab Economic Research Institute, Pakistan
Costinela Fortea,
Dunarea de Jos University, Romania
Waqar Ahmad,
International Islamic University Islamabad,
Pakistan
Muhammad Umair,
Emerson University Multan, Pakistan

*CORRESPONDENCE

Zhen Tian
✉ tianzhen_1999@sina.com
Xing Yu Bian
✉ lygbxy@outlook.com

RECEIVED 07 December 2024

ACCEPTED 07 February 2025

PUBLISHED 25 February 2025

CITATION

Tian Z, Bian XY and Tan Y (2025) The evolution of the consumption behavior of rural households in China: logical motivation and policy responses.
Front. Sustain. Food Syst. 9:1541239.
doi: 10.3389/fsufs.2025.1541239

COPYRIGHT

© 2025 Tian, Bian and Tan. This is an open-access article distributed under the terms of the [Creative Commons Attribution License \(CC BY\)](#). The use, distribution or reproduction in other forums is permitted, provided the original author(s) and the copyright owner(s) are credited and that the original publication in this journal is cited, in accordance with accepted academic practice. No use, distribution or reproduction is permitted which does not comply with these terms.

The evolution of the consumption behavior of rural households in China: logical motivation and policy responses

Zhen Tian*, Xing Yu Bian* and Yan Tan

Business School, Yangzhou University, Yangzhou, China

Based on provincial panel data from rural household surveys in China from 1978 to 2021, this paper constructs an econometric model of rural household consumption behavior covering the influencing factors of income level, habit formation, uncertainty and the urbanization degree etc. The SYS-GMM estimation method is applied to empirically study the basic logic and general rules of the evolution of rural household consumption behavior in three different stages of China's well-off society construction practices since the reform and opening-up. The results indicate that the motivators of evolution of rural household consumption in China have shifted from purely endogenous and demand-side factors to the combined effects of endogenous and exogenous factors as well as supply-side and demand-side factors since the reform and opening up. Therefore, in the context of global economic slowdown with challenges to economic globalization, it becomes crucial to adopt the strategy that can effectively synchronize supply-side structural reforms with demand-side structural adjustments based on the practical situations of China's rural households. Such a strategy is geared towards fostering a more advanced dynamic equilibrium that is propelled by demand-induced supply and supply-generated demand, aiming to enhance rural consumption, stimulate the domestic economic cycle and fulfill the people's growing aspirations for a more prosperous life.

KEYWORDS

rural households in China, evolution of consumption behavior, general rules, policy responses, reform and opening-up

1 Introduction

Since the beginning of the 21st century, the contribution of final consumption to China's economic growth became significantly lower than that of investment. The continuous low rate of household final consumption is the primary reason behind the insufficient final consumption. According to statistical data, China's final consumption rate is 45.7% in 2022, which is much lower than that of other major economies including the United States (68.8%), the European Union (52.2%), Japan (55.6%), South Korea (48.1%), India (60.6%), and Vietnam (54.9%). Therefore, China's final consumption rate remains notably low with household consumption demonstrating the features of insufficient effective demand and persistent sluggish growth. The low consumption levels of rural residents constitute a primary factor contributing to the overall insufficiency of domestic consumption in China (Qi and Li, 2018). As China's economy transitions from rapid-growth phase to high-quality-development one, it

is quite crucial to stimulate consumption, particularly in rural areas, for achieving sustainable and high-quality economic growth (Ren and Miao, 2021). Scholars generally believe that rural residents' consumption demand constitutes a critical foundation for facilitating robust domestic economic cycle (Xie and Wei, 2022). Thus, it is necessary to actively cultivate the consumption focus of rural residents, enhance their consumption motivation and gradually stimulate rural consumption to become the main engine of China's economic growth (Zhang and Tu, 2022). Since the strategy of "expanding domestic demand" was implemented in 1998, the central government has introduced a series of policy measures to stimulate rural residents' consumption, but the overall effect is far from being significant and the expected goals have not been achieved (Tan, 2021). The main reason is that improving the consumption level of rural residents is not simply about releasing purchasing power and increasing consumption expenditure, which may lead to low-level and low-quality repeated consumption. The consumption of rural residents cannot be sustainably and effectively expanded. Therefore, sticking to the people-oriented development concept, we should keep the fundamental objectives of sufficiently meeting the consumption needs of rural residents and improving their quality of life, tackling the bottleneck factors that restrict rural residents' consumption so as to provide sustainable and strong impetus for the improvement of their consumption level (Hong, 2010).

The household is the most fundamental consumption unit of the majority of products and services with most consumption activities taking place within the family. Therefore, the term "consumer" does not mean an individual but a household (Mansfield, 1992), and the research on the consumption of rural residents ultimately needs to be focused on the rural households. As the consumption activities of rural households occur within a specific socio-economic context, and influenced and constrained by some factors like national macroeconomic policies as well as social and economic structures, their consumption behavior is bound to exhibit distinctive phase characteristics under various circumstances of different systemic policies and socio-economic environments. Along with the transformation of planned economic system to market economic system since China's reform and opening-up, the deep reforms in the realms of pricing, taxation and finance have promoted the vigorous development of the consumption market as well as the profound changes in the consumption behavior of rural households. In contrast to the fact that the consumption behavior of rural households demonstrate high similarities under the circumstance of shortage economy, the consumption behavior of rural households in China has undergone qualitative changes in terms of level, structure, concepts, and tendencies since the reform and opening up, which is named as the "evolution of consumption behavior." So, what are the reasons for the evolution of consumer behavior among rural households in China? How can the government formulate development strategies to expand rural consumption based on the factors constraining rural household consumption at different stages of development?

The consumption behavior of rural households is influenced by the confluence of diverse motivations. Their consumption upgrading is a gradual dynamic upward process accompanied with the continuous coordination and matching between supply and demand. Although existing literature has yielded rich research findings on the characteristics, evolutionary patterns, and influencing factors of rural households consumption behavior, systematic explanations for the

transformational dynamics of consumption patterns remain quite scarce. Since former Chinese leader, Deng Xiaoping, first proposed the goal of building China into a well-off society in the late 1970s, China has succeeded in building a well-off society in all-round way by 2021. Drawing upon the existing research ideas, we divide this period into three distinct phases: the subsistence stage (1978–1991), the overall well-off society construction stage (1992–2001), and the all-round well-off society construction stage (2002–2021). Based on the panel data of the survey of Chinese rural household in 30 provinces (municipalities directly under the Central Government and autonomous regions, excluding Tibet) from 1978 to 2021, this paper constructs an econometric model of rural household consumption behavior including factors of income level, habit formation, uncertainty and urbanization level, and applies the SYS-GMM estimation method to empirically study the reasons for the evolution of rural residents' consumption behavior in three different stages of China's well-off society construction practices since the reform and opening-up. On this basis, the paper studies the underlying logic and general patterns of this evolution. This research not only enriches the theoretical and empirical understanding of rural household consumption behavior, but also offers theoretical underpinnings and empirical evidences for the government to improve the policy ideas about rural consumption expansion. However, due to the limited length of this paper, the exploration on the policy system regarding the supply and demand synergism for expanding rural household consumption is not specific and deep enough exploration, which will be the direction of the future study.

2 Theoretical analysis of the influencing factors of rural household consumption behavior

In view of the Southeast Asian financial crisis and the global economic crisis in 2008, it has become a hot research topic about how to expand domestic demand and stimulate rapid economic growth. In particular, the phenomenon of "Low Consumption, High Savings" among Chinese rural households has drawn widespread attention in the academic area. Researchers have conducted empirical studies on many factors that affect household consumption of rural residents in China.

2.1 Analysis of demand-side factors influencing rural household consumption behavior

2.1.1 Income and rural household consumption

On one hand, the actual absolute income level of rural households directly influences their consumption expenditure. According to Keynes's Absolute Income Hypothesis, there is a stable functional relationship between the absolute income level of residents and their consumption expenditure. Consumption expenditure will increase with the rise of absolute income level. On the other hand, the relative income level of rural households also affects their consumption expenditure. Based on Duesenberry's Relative Income Hypothesis, what determines the consumption level of rural households is not just absolute income but also relative income, which is influenced by

factors like the income gap between urban and rural residents and the internal income gap among rural residents. The widening income gap will directly reduce the income expectations of rural households especially in the context of lacking effective protection for rural residents to increase their income, the imperfect rural social security system, and the immature rural credit system. Most rural households will dare not consume freely or easily overdraft future income, which results in an “inhibitory effect” of consumption, further strengthening savings motivation and reducing immediate consumption level (Hu, 2009). On the contrary, some studies also indicate that income gap might lead to “expenditure cascade,” which means the demonstration effect of high-income households consumption can result in the increase of the consumption expenditure of the entire society (Frank et al., 2014).

2.1.2 Uncertainty and rural household consumption

Uncertainties refer to non-probabilistic random events (Knight, 2005), which are unforeseen and immeasurable changes including both natural and social uncertainties. The former are originated from external environmental risks caused by force majeure, while the latter primarily are caused by controllable factors such as systems and policies (Sun, 2002). Uncertainty is one of the main factors affecting consumption behavior. Although China has adopted a gradual approach in the process of marketization, some transitional system arrangements have a certain degree of social uncertainty due to the difficulty of achieving Pareto optimality of the reform and the limitations of the rationality of decision-maker, which affects consumer behavior. The social uncertainty factors affecting the consumption practices of rural households include income uncertainty and consumption uncertainty. On one hand, rural residents lack stable sources and effective guarantee mechanisms for income increase because of those facts like the high dependence of agricultural production on natural conditions, big fluctuations of agricultural product prices and non-agricultural employment difficulties for rural migrant workers. Rural households generally suffer unpredictable income fluctuations and high income uncertainty (Chen, 2014). On the other hand, reforms in income distribution, healthcare, education, employment and social security have significantly increased the uncertainty of future expenditure expectations of rural households. Price or supply–demand fluctuations of consumption objects can also lead to uncertainty in their consumption expenditure. Thus, consumption uncertainty exists as well (Wang et al., 2013).

2.1.3 Habit formation and rural household consumption

As the consumption behavior of consumers is not reversible and the consumption utility is not divisible or additive in terms of time, the utility increase from a given level of the increased consumption and the utility decrease from a similar level of the decreased consumption are not equivalent for consumers (Lei, 2009). People are generally more sensitive to the utility loss resulting from the reduced consumption levels, which is primarily because consumers form the consumption habits during the consumption process due to the memory of past consumption patterns and levels. Once these consumption habits are formed, they are generally difficult to change in the short term. Thus, given a fixed level of immediate consumption,

the larger the stock of consumption habits is, the smaller the utility of immediate consumption is (Cui and Hang, 2014). Therefore, consumer's expenditure level is influenced by both the immediate income level and the past consumption habits. The more stable the consumption structure is, the stronger the impact of consumption habits on the immediate consumption expenditure level is. When the immediate income level declines, consumption is rigid in the short term. In view of the consumption habits formed during past income peaks, consumers may find it hard to immediately reduce expenditure and tend to maintain their current consumption level by reducing savings or borrowing, which creates a “ratchet effect” of consumption and alleviates the impact of income changes on consumption to some extent (Duesenberry, 1949). According to the theory of habit formation, researchers generally categorize habit formation into internal habit formation and external habit formation (Deaton, 1992). Internal habit formation refers to the influence of consumers' past consumption habits on their immediate consumption behavior, while external consumption habits denote the impact of the external social environment or relevant consumer groups with demonstration effects on consumers' own consumption behavior (Cui and Fan, 2011).

2.1.4 Demographic structure and rural household consumption

According to the Life Cycle Hypothesis proposed by Modigliani and Brumberg, if consumers are rational, based on an accurate forecast of their lifetime income and wealth levels, they will smooth out their consumption expenditure over different periods of the life span through savings and borrowings so as to achieve inter-temporal optimal allocation and the most ideal distribution of consumption with the maximization of lifetime utility effects (Modigliani and Brumberg, 1954). Therefore, when the population age structure is relatively stable, the consumption tendency of the entire society is unlikely to experience significant fluctuations. However, if the proportion of the working-age population increases, the consumption tendency of the entire society will decrease. Conversely, when the proportion of children and the elderly to the whole population increases, the consumption tendency of the entire society will rise (Chen, 2011). Thanks to the adjustment of birth policies, and significant improvements in healthcare conditions, enormous changes have taken place in China's population age structure featured with continuous decline in fertility rates and the intensified trend towards aging and increased longevity since the reform and opening-up (Zheng, 2007). The resulting changes in the child dependency ratio and the elderly dependency ratio will inevitably affect the saving rates and consumption expenditure levels of households. In addition to the age structure of the population, the gender composition of the population may also impact household consumption. On one hand, consumption itself exhibits notable gender differences to some extent. As described in Baudrillard's “The Consumer Society,” there are two types of consumption patterns, which are named as “high requirement, selective” male paradigm and the “flattering, narcissistic” female paradigm (Baudrillard, 2000), with women being the main force of consumption. On the other hand, due to the traditional preference for boys, there is certain discrimination against girls in rural areas in terms of education and nutritional intake (Schultz, 1985), resulting in the household expenditure on girls being significantly lower than that on boys. The implementation of the family planning policy has led to a higher proportion of male infants compared to that of female infants

in the newborn population of rural China (Li and Qiu, 2012), and an imbalance in the gender ratio of the population in rural areas, which may affect the consumption levels of rural households.

2.2 Analysis of supply-side factors influencing rural household consumption behavior

2.2.1 Liquidity constraints and rural household consumption

Liquidity constraints refer to the restrictions and limitations that consumers are unable to obtain liquidity support through external financing channels due to information asymmetry in the credit market. As long as systemic barriers like capital market imperfections exist, liquidity constraints in the financial market are inevitable (Stiglitz and Weiss, 1981). Developing countries often suffer more severe liquidity constraints due to imperfect credit markets and inefficient capital markets (Wang and Zhang, 2002). Liquidity constraints affect residents' consumption mainly in the following two ways. Firstly, immediate liquidity constraints prevent residents from smoothing their consumption through credit markets even when they have positive expectations for future income, resulting in potential consumption demand not in line with the significant decrease in immediate consumption expenditure compared to the scenario without liquidity constraints. Secondly, future liquidity constraints mean the anticipated difficulty in obtaining external financing in future, which makes residents spontaneously reduce immediate consumption, increase savings and accumulate wealth so as to prevent possible sharp decline in consumption and living standards in the event of expected future income decline or significant uncertainty (Tian, 2004). The rural financial market in China is relatively underdeveloped with few credit products developed by banks to meet the needs of rural households. In addition, as most rural households themselves lack effective loan mortgage and stable and sufficient future income security (Wang, 2014), they can only cope with the common liquidity constraints by reducing immediate consumption expenditure and expanding savings.

2.2.2 Urbanization and rural household consumption

Instead of simple urbanization of population and land, urbanization is more about promoting the fundamental transformation of population occupation, industrial structure, living environment, social security and lifestyle on the basis of rebuilding the urban–rural division of labor order, ultimately achieving comprehensive and free development of people without distinctions (Gao and Zhang, 2015). Before the reform and opening-up, the Central Committee of the Communist Party of China implemented the strategy of giving priority to the rapid development of heavy industry with cities acting as the main space carrier, and built a dual economic and social system in urban and rural areas based on the household registration system, which directly led to the artificial division and separate governance of urban and rural areas. After the reform and opening up, the central government lifted the restrictions on rural residents migrating to cities for work at the national policy level for the first time and promoted the development of urbanization. Afterwards, the rapid emergence of township enterprises in the late

1980s and the rise of private economy and export-oriented economy in the early 1990s promoted the rapid development of labor-intensive light industry, which entirely eliminated the urban–rural market segmentation of products and factors caused by the dual urban–rural economic structure and encouraged a large number of migrant workers to work in cities. Since entering the stage of building an overall well-off society, the central government further clarified the strategy of coordinated urban–rural development and proposed to promote the citizenization of rural migrant population in an orderly manner to ensure the urban integration of migrant workers. Thanks to urbanization, the income level of rural households increased due to the aggregation of elements and resources such as population and land. Meanwhile, the proportion of wage income in rural household earnings increased as a result of the non-agriculturization of production methods, which thus elevated the average consumption tendency and consumption level of rural households (Yi et al., 2013). In addition, according to Relative Income Hypothesis of Duesenberry, a person's consumption is often influenced by others of the same social class in view of social comparison (Easterlin, 1974) and status seeking (Hirsch, 1976), which can be explained by the “demonstration effect” of consumption through mutual imitation and comparison. Therefore, the in-depth advancement of urbanization will make a “demonstration effect” on the consumption behavior of rural households through the urban–rural linkage mechanism (Zhou and Yang, 2009), thereby enhancing their motives for stimulative and conspicuous consumption (Xu and Zhang, 2021) and upgrading their consumption level.

2.2.3 Price levels and rural household consumption

Existing theories on household consumption are generally based on the implicit assumption that price levels keep stable and unchanged, which is clearly not in line with the reality. In fact, according to the econometric tests of time series data on price indices from various countries around the world, it is proved that price fluctuations exhibit significant random walk characteristics (Lei, 2013), price levels are unstable, and inflation and deflation are both normal. Inflation affects rural household consumption through income effects and substitution effects. On one hand, the depreciation of currency caused by inflation leads to less monetary income for rural households, lower income expectations as well as weaker actual purchasing power, which thereby suppresses their consumption. On the other hand, as inflation will cause the continuous depreciation of savings, people's expectation of future price increases, which will encourage rational consumers to increase immediate consumption to replace cash savings so as to cover the possible loss from the delayed consumption (He and Wang, 2018). The impact mechanism of deflation on rural household consumption is just vice versa. Therefore, price fluctuations inevitably affect household consumption with significant differences in the impacts on urban and rural households as well as the households of different income levels.

2.2.4 Consumption environment and rural household consumption

Changes in the consumption environment can make consumers make different utility evaluations about the same item, thus affecting their consumption. The consumption environment is an accumulative concept of varieties of external objective factors that may influence consumer behavior, including both hard environments of

infrastructure and soft environments of institutional construction (Feng and Liu, 2008). Rural infrastructure includes productive facilities such as agricultural water conservancy and machinery as well as living facilities like transportation, electricity, and communication etc. The promotion and application of productive infrastructure in rural areas can help surpass the temporal and spatial limitations of natural resources, optimize the input structure of production factors, improve the intensification, scale, and standardization level of agricultural production continuously, and thus improve the consumption level of rural households through the effect of increased income (Ouyang et al., 2021). The improvement of rural living infrastructure can shorten the circulation cycle of commodity in the industrial chain, improve circulation efficiency, enrich the supply of consumption goods in rural markets (Long and Zhang, 2021), provide the most fundamental material sources like transportation, electricity and network for supporting the full use of consumption goods (Geng, 2012), stimulate the willingness of rural households to purchase high-grade consumption goods and transform their potential consumption needs into real purchasing power, thus promoting the quality improvement and upgrading of rural household consumption. Furthermore, along with the optimization and improvement of institutional construction and public service in those areas such as education, healthcare, sanitation, employment and social security, rural residents can not only increase income and enhance consumption capacity by improving the physical health, knowledge level and occupational skills but also reduce their expenditures on public goods and services and increase their spending on private products like high-graded durable goods. Additionally, the establishment and improvement of the rural social security system can weaken rural residents' precautionary saving motivations caused by expectations of uncertainties regarding illness, aging and other factors, which can help increase immediate consumption expenditure.

3 Model construction, variable selection, and data sources

3.1 Model construction

Panel data can fully reflect the heterogeneity of samples in terms of time and individuals, thereby expanding the sample size, increasing the sampling precision of estimators and reducing collinearity among variables. Meanwhile it can also adequately take the commonality and individual specific effects of cross-sectional data into consideration, thereby reducing estimation biases caused by unobservable variables and making the model setting more rational and the coefficient estimates more effective. This study uses provincial panel data from 1978 to 2021 and adopts the following panel data model (see Equation 1) to analyze the main factors influencing the consumption behavior of rural households during three different stages of China's well-off society construction since the reform and opening-up. Based on this analysis, the basic logic and general rules of the evolution of rural household consumption behaviors are summarized:

$$CON_{it} = \beta_0 + \beta_1 L.CON_{it} + \beta_2 X + \varepsilon_{it} \quad (1)$$

In the formula, the subscript i represents the province, and t denotes time. CON_{it} signifies per capita consumption expenditure of

rural households, X is a vector of explanatory variables, and is the random error term. The model includes an indicator of past consumption habits of rural households ($L.CON_{it}$), which is represented by the level of per capita consumption of rural households lagged by one period, i.e., an endogenous variable of the explanatory variables lagged by one period. In view of this, it may lead to correlation between the explanatory variables and the random disturbance term. Therefore, Model 3.1 is a typical dynamic panel model with inconsistent estimates within the group and significant deviations. If the general OLS method is used for estimation, the estimated parameters are biased and inconsistent. There are generally two types of empirical analysis methods applicable to dynamic panel models. The first is the Difference Generalized Method of Moments (DIFF-GMM), which can solve endogeneity issues and eliminate individual effects (Wang C. Q. et al., 2020). However, there is a correlation between the lagged variable of the dependent variable and the error term, which may cause problems such as loss of sample information and distortion of coefficient estimates (Wang X. H. et al., 2020). The second method is the System Generalized Method of Moments (SYS-GMM), which fully utilizes the information of horizontal and differential changes to effectively combine the horizontal regression equation and differential regression equation (Blundell and Bond, 1998), thereby compensating for the inherent flaws of the DIFF-GMM method. On the basis of ensuring statistical consistency, it reduces estimation errors and improves estimation efficiency (Arellano and Bover, 1995), which is generally more effective than differential generalized moment estimation. The SYS-GMM estimator is typically implemented through two distinct approaches: one-step estimation and two-step estimation. The one-step approach directly utilizes the initial weight matrix for GMM estimation, while the two-step procedure involves constructing an optimized weight matrix based on the one-step estimation results, followed by the subsequent GMM estimation. Existing studies have demonstrated that one-step estimator exhibits superior stability in small sample scenarios (Arellano and Bond, 1991; Blundell and Bond, 1998; Windmeijer, 2005; Roodman, 2009). Consequently, this study employs the one-step SYS-GMM approach for estimating Model 3.1. Furthermore with reference to Roodman (2009). We implement the collapse of instruments technique to mitigate the instrument proliferation problem that arises from the rapid expansion of the instrument matrix with increasing time dimensions.

3.2 Variable selection and explanation

3.2.1 Dependent variable

The dependent variable is rural resident consumption (CON). This indicator is measured by per capita consumption expenditure of rural resident households, which is adjusted by the rural consumer price index of each province (municipality directly under the Central Government, autonomous region). In addition, the logarithm of the variable is taken to increase the smoothness of the data and reduce the potential result bias originated from heteroscedasticity.

3.2.2 Explanatory variables

Based on the literature review of the factors influencing the consumption behavior of rural resident households and considering

the availability of data, this paper primarily selects the following explanatory variables (selection and explanation of explanatory variables as seen in [Table 1](#)):

- (1) *Per Capita* Disposable Income of Rural Residents (INC): it reflects the impact of the actual absolute income level of rural households on consumption expenditure, which is adjusted by the consumer price index of rural residents in each province (municipality directly under the Central Government, autonomous region). Considering its relatively large numerical values, this paper adopts logarithmic form.
- (2) Income Gap between Urban and Rural Areas (GUR): it is measured by the urban–rural income gap index to reflect the impact of the relative income level of rural households on consumption expenditure, which is calculated as follows: urban–rural income gap index = disposable income of urban residents/ disposable income of rural residents.
- (3) Uncertainty (INU): there is no consensus on the measurement of uncertainty in the academic literature. This paper uses income uncertainty indicator to reflect the impact of uncertainty on the consumption level of rural households. With reference to the approach proposed by the scholars like [Wang and Xu \(2010\)](#), income uncertainty is defined as the random fluctuation of income that cannot be accurately

predicted with the income adjustment deviation rate indicator being used to measure the income uncertainty of rural households. The specific calculation formula is as follows:

$$INU_t = \frac{Y_t - EY_t}{EY_t} = \frac{Y_t - Y_{t-1}(1 + r_t)}{EY_t} \quad (2)$$

$$r_t = (r_{t-1} + r_{t-2} + r_{t-3}) / 3 \quad (3)$$

In [Equations 2, 3](#), EY_t represents the expected per capita income level of rural households in year t , Y_t is the actual per capita income level of rural resident households in year t , and r_t is the expected income growth rate for rural households in year t that is measured by the average growth rate of actual income for rural households over the previous three years ([Wang, 2010](#)).

- (4) Internal Habit Formation (IHF): it is measured by per capita consumption level of rural residents lagging behind one period, reflecting the impact of rural residents' past consumption habits on their immediate consumption behavior. It is adjusted by the consumption price index for rural residents in each province (municipality directly under the Central Government, autonomous region) and expressed in logarithmic form.

TABLE 1 Selection and explanation of explanatory variables.

Influence factors	Indicator	Variable name	Indicator description
Income Level	Absolute Income Level of Rural Households	INC	<i>Per Capita</i> Disposable Income of Rural Residents
	Relative Income Level of Rural Households	GUR	Urban–Rural Income Gap Index = Disposable Income of Urban Residents/ Disposable Income of Rural Residents
Uncertainty	Uncertainty of Income	INU	Income Adjustment Discrepancy Rate = (Expected Disposable Income of Rural Residents—Actual Disposable Income of Rural Residents)/ Expected Disposable Income of Rural Residents.
Habit Formation	Internal Habit Formation	IHF	<i>Per Capita</i> Consumption Level of Rural Residents Lagging Behind One Period
	External Habit Formation	EHF	<i>Per Capita</i> Consumption Level of Urban Residents Lagging Behind One Period
Population Structure	Total Dependency Ratio	TDR	Total Dependency Ratio = Number of Non-Working-Age Population/ Number of Working-Age Population
Liquidity Constraint	Average Propensity to Save	LIC	Average Propensity to Save = (<i>Per Capita</i> Cash Income of Rural Households— <i>Per Capita</i> Cash Expenditure of Rural Households)/ <i>Per Capita</i> Cash Income of Rural Households
Urbanization	Urbanization Rate of the Population	URB	Urbanization Rate of the Population = Urban Population/Total Population
Price Level	Rural Consumer Price Index	CPI	--
Consumption Environment	Agricultural Water Conservancy Infrastructure	FWI	Effective Irrigated Area of Farmland
	Rural Transportation Infrastructure	RTI	Highway Mileage in Land Area = Total Highway Mileage/Land Area of Each Province
	Rural Energy Supply Infrastructure	REI	Total Electricity Consumption in Rural Areas
	Rural Public Services	RPS	Number of Technical Personnel in Health Institutions Per 10,000 People in Rural Areas

- (5) External Habit Formation (EHF): it is measured by per capita consumption level of urban residents lagging behind one period, reflecting the demonstration effect of other consumer groups on the immediate consumption of rural households. It is adjusted by the consumption price index for urban residents in each province (municipality directly under the Central Government, autonomous region) and expressed in logarithmic form.
- (6) Total Dependency Ratio (TDR): it is measured by the ratio of the non-working-age population (including children aged from 0 to 14 years old and the elderly aged 65 and above) to the working-age population (aged from 15 to 64 years old), reflecting the impact of the age structure of rural households on consumption expenditure.
- (7) Liquidity Constraint (LIC): with reference to the research findings of some researchers like Tian Gang and Wang Baijie, this paper measures liquidity constraints with the average propensity to save. The specific calculation method is as follows: $\text{Average Propensity to Save} = (\text{Per Capita Cash Income of Rural Households} - \text{Per Capita Cash Expenditure of Rural Households}) / \text{Per Capita Cash Income of Rural Households}$.
- (8) Urbanization (URB): according to general academic practices, this paper measures the level of urbanization development with the urbanization rate of the population. The specific calculation method is as follows: $\text{Urbanization Rate of Population} = \text{Urban Population} / \text{Total Population}$.
- (9) Price Level (CPI): this paper uses the Rural Consumer Price Index to reflect the impact of rural price fluctuations on rural household consumption.
- (10) Agricultural Water Conservancy Infrastructure (FWI): considering that the effective irrigation area of farmland can roughly reflect the direct effects brought by the improvement of farmland water conservancy infrastructure, this paper uses the effective irrigation area of farmland as the proxy indicator of farmland water conservancy infrastructure and takes its logarithm to increase the smoothness of the data.
- (11) Rural Transportation Infrastructure (RTI): referring to Demurger's research findings, this paper uses the ratio of the total length of highways to its land area in each province as a proxy variable for rural transportation infrastructure (Demurger, 2001).
- (12) Rural Energy Supply Infrastructure (REI): considering that electricity is the most widely used and extensive source of energy in rural areas, this study measures the status of rural energy supply infrastructure with rural electricity supply infrastructure. However, due to the fact that there are too many power supply points with widely dispersed network, accurate indicators for measuring rural power supply infrastructure are not available. Referring to the research findings of scholars like Zhang and Dai (2018), this paper uses the total electricity consumption in rural areas as the proxy indicator for rural electricity supply infrastructure and takes its logarithm to increase the smoothness of the data.
- (13) Rural Public Services (RPS): the system of education, medical care, health, employment and the soft environment of public services are important factors affecting the consumption level of rural households. Considering the availability of data, this

paper refers to the existing research result of Geng (2012) by using the number of technical personnel in health institutions per 10,000 people in rural areas as a proxy indicator to test the impact the rural public services on rural resident households.

3.3 Data description and descriptive statistical analysis

This study selects provincial panel data from 1978 to 2021 in 30 provinces (municipalities directly under the Central Government, autonomous regions) in China, excluding Tibet. The data originates from official statistical publications including "Compilation of Statistical Data for 60 Years of New China" "China Statistical Yearbook" "China Rural Statistical Yearbook" and the statistical yearbooks of 30 provinces (cities). As Hainan Province was established after the revocation of Hainan Administrative Region of Guangdong Province in 1988 and Chongqing Municipality was only established in 1997, the data of these two places are not covered in the first stage of model regression and the data of Chongqing Municipality is not considered in the second stage of model regression. The non-standard statistical system and unsound statistical methodologies in the early stages of reform and opening-up result in the inconsistencies of statistical standards, the exclusion of critical data from the statistical framework or severe data missing. In view of this reason, this paper does not take into account the variables of demographic structure and liquidity constraints in econometric models when analyzing the reasons for the evolution of rural households consumption behavior in the subsistence stage and the overall well-off society construction stage. In addition, because the data about the consumption price indices for urban or rural residents before 1985 are missing, this paper applies the data before 1985 in nominal terms and adjusts that after 1985 based on the year of 1985 when some relative indicators are smoothed for eliminating the impact of price factor. Since the consumption price indices for urban or rural residents in four municipalities have not been published during the process of adjustment, the local consumption price index is used instead by referring to the approach of those researchers like Wang and Wen (2016). Linear interpolation method is applied to supplement a few missing values. Descriptive statistical analyses of all variables are shown in Table 2.

4 Analysis of empirical results

4.1 Model checking

To systematically analyze the drivers underlying the transformational dynamics of rural household consumption behavior in China since the reform and opening-up, this study employs the dynamic panel SYS-GMM estimation to empirically examine the determinants of rural household consumption behavior across three distinct phases of Well-off society construction. The empirical analysis aims to elucidate the fundamental logic and general patterns governing the evolution of rural household consumption behavior. The statistical test results (Table 3) demonstrate strong overall model significance, as evidenced by the p -values of the joint significance Wald tests across all three phases. Furthermore, the Sargan test results, with p -values

TABLE 2 Descriptive statistical analysis of variables.

Variables	Subsistence stage (1978 ~ 1991)				Overall well-off society construction stage (1992 ~ 2001)				All-round well-off society construction stage (2002 ~ 2021)			
	Mean	S.D	Min	Max	Mean	S.D	Min	Max	Mean	S.D	Min	Max
CON	5.52	0.45	4.38	6.79	6.08	0.34	5.45	7.00	7.34	0.59	6.01	8.73
INC	5.70	0.46	4.60	6.88	6.23	0.38	5.48	7.14	7.43	0.60	6.06	8.90
GUR	2.03	0.47	0.97	4.03	2.60	0.61	1.24	4.31	2.65	0.49	0.03	4.55
INU	0.04	0.14	−0.8	0.55	−0.0	0.07	−0.3	0.17	−0.0	0.03	−0.27	0.09
IHF	5.52	0.45	4.38	6.79	6.08	0.34	5.45	7.00	7.34	0.59	6.01	8.73
EHF	6.28	0.36	4.04	7.08	6.95	0.26	6.44	7.73	8.02	0.42	7.11	9.07
TDR	-	-	-	-	-	-	-	-	0.38	0.72	0.19.	0.57
LIC	-	-	-	-	-	-	-	-	0.20	0.11	−0.16	0.51
URB	0.26	0.16	0.01	0.77	0.37	0.19	0.13	0.89	0.53	0.15	0.20	0.90
CPI	1.06	0.06	0.95	1.29	1.06	0.08	0.96	1.28	1.02	0.02	0.97	1.23
FWI	7.04	0.88	5.03	8.42	7.10	0.93	5.14	8.48	7.26	1.02	4.69	8.78
RTI	3.26	1.79	0.21	9.72	0.28	0.16	0.01	0.96	0.82	0.47	0.05	2.11
REI	2.50	0.96	−0.3	4.65	3.50	1.22	0.95	6.13	4.63	1.36	0.81	7.60
RPS	-	-	-	-	-	-	-	-	3.94	0.35	2.97	4.92

Data Source: National and regional statistical yearbooks from 1978 to 2022 and other official statistical data (the values of relevant indicators have been logarithmically transformed and those marked with “-” indicate missing statistical data).

TABLE 3 SYS-GMM estimation results of model 3.1 for three different stages of well-off society construction since the reform and opening-up.

Explanatory variables	Subsistence stage	Overall well-off society construction stage	All-round well-off society construction stage
	SYS-GMM	SYS-GMM	SYS-GMM
INC	0.516*** (0.126)	0.227*** (0.075)	0.422*** (0.032)
GUR	0.052 (0.028)	−0.011 (0.026)	0.006 (0.005)
INU	−0.065* (0.035)	−0.148*** (0.067)	−0.275*** (0.029)
IHF	0.609*** (0.114)	0.744*** (0.046)	0.559*** (0.033)
EHF	−0.002 (0.025)	0.117* (0.061)	0.055*** (0.005)
TDR	-	-	0.013** (0.013)
LIC	-	-	−0.004*** (0.001)
URB	−0.039 (0.030)	−0.030 (0.022)	0.031** (0.014)
CPI	0.100 (0.281)	−0.109 (0.042)	−0.708 (0.108)
FWI	0.016 (0.008)	0.004 (0.008)	0.002** (0.001)
RTI	0.001 (0.002)	0.408** (0.205)	0.001 (0.001)
REI	−0.011 (0.008)	−0.005 (0.007)	0.002*** (0.001)
RPS	-	-	−0.008 (0.003)
AR(1)	0.000	0.000	0.000
AR(2)	0.878	0.494	0.208
Wald	0.000	0.000	0.000
Sargan	0.905	0.567	0.988

Small sample adjustments are made during model estimation. The values of AR test, Wald test, and Sargan test represent *p*-values corresponding to the test statistics. The symbols ***, **, and * indicate significance at the levels of 1, 5, and 10%, respectively. The values in parentheses are standard errors.

exceeding 0.15, confirm the overall validity of the instruments and their lag orders in all three models. Additionally, the AR(1) and AR(2) tests for residual serial correlation indicate the absence of autocorrelation in the random error terms (μ) across all three phases.

The SYS-GMM estimator is susceptible to significant bias under the conditions of limited sample size or weak instruments (Yu et al., 2015). The pooled OLS in the dynamic panel data model tends to overestimate the lagged term coefficient due to its failure to account

TABLE 4 Estimation results of the lagged term (IHF) in different models.

Estimation methods	Subsistence stage	Overall well-off society construction stage	All-round well-off society construction stage
FE	0.520*** (0.036)	0.221*** (0.062)	0.020* (0.012)
SYS-GMM	0.609*** (0.114)	0.744*** (0.046)	0.559*** (0.033)
Pooled OLS	0.763*** (0.190)	0.795*** (0.035)	0.960*** (0.008)

The symbols ***, **, and * indicate significance at the levels of 1, 5%, and 10, respectively.

for individual fixed effects, whereas the fixed effects model tends to underestimate the lagged term coefficient due to the elimination of individual heterogeneity. In order to address this methodological challenge, [Blundell and Bond \(1998\)](#) propose the intuitive diagnostic framework to verify the robustness of SYS-GMM estimates through examining whether the lagged term coefficient of SYS-GMM falls within the range between those of the fixed effects model and the pooled OLS. With reference to the methodological approach of [Yu et al. \(2015\)](#), this study conducts comparative analysis of the lagged term coefficients of three models in each phase. Specific results are shown in [Table 4](#). The empirical findings demonstrate that the lagged term coefficients of SYS-GMM models consistently reside within the range between those of the fixed effects model and the pooled OLS across all phases, which thereby provides robust empirical support for the validity and reliability of the estimation results.

4.2 Analysis of empirical results during subsistence stage

After the reform and opening-up, Chinese government started to make the systematic transition from planned economy to dual-track economy through progressively reducing the functioning scope and intensity of traditional planning mechanisms and enhancing the function of market-based resource allocation ([Guo, 2003](#)). This institutional transformation was strategically designed to eliminate fundamental constraints on social productivity development. From 1982 to 1986, the Central Committee of the Communist Party of China issued five consecutive No. 1 Central Documents regarding rural reform priorities, particularly about the household responsibility system, so as to stimulate rural economic development and increase farmers' incomes. Thanks to these reforms, the basic subsistence problems for rural households were successfully resolved and fundamental consumption needs for living were effectively secured by 1991. Based on provincial panel data from 1978 to 1991, this paper uses dynamic panel SYS-GMM to estimate the influencing factors of rural household consumption behavior (as shown in [Table 3](#)). The results show that per capita disposable income, income uncertainty and internal habit formation of Chinese rural households had significant impacts on their consumption behavior during the subsistence stage, which indicates that the consumption behavior of rural households in China during this stage was affected by income level and uncertainty with significant habit formation effect.

Under the highly centralized planned economy operation mechanism before the reform and opening up, consumption goods were severely insufficient in supply and totally lacked price elasticity. There was no uncertainty in terms of income or expenditure in consumption behavior. Constrained by this special social background and external environments, Chinese rural residents were mostly

myopic and primitive with weak backward and attachment consciousness, which results in the fact that the consumption expenditure of rural residents in China was highly correlated with their immediate income level before the economic reform and opening-up and their consumption behavior generally can be well explained by Keynesian absolute income hypothesis theory ([Liu and Dai, 2012](#)). After the economic reform and opening-up, the establishment of the household contract responsibility system has greatly stimulated the production motivation of rural residents, terminating the long-standing stagnation of income levels and solving the problem of food and clothing on national level. However, income still remained as the key factor affecting the consumption behavior of rural households. The estimated coefficient of the impact of per capita disposable income of rural households on their consumption level during this stage is 0.516 and significant at the 1% level, indicating that for every 1% increase in per capita disposable income of rural households, their consumption expenditure would increase by 0.516%. Thus, rural household consumption expenditure demonstrates clear income dependence characteristics.

At the same time, with the market role strengthened in adjusting economic activities and resource allocation after the reform and opening-up, the socialist market price mechanism has gradually formed and improved with the vitality of consumption market effectively stimulated and product volumes and varieties highly enriched along with the rapid economic development. Around the 1990s, China's consumption goods market gradually reached equilibrium with consumption environment significantly improved ([Wan et al., 2001](#)). Chinese rural residents became the consumers under the modern market economy system rather than under the traditional planned economy system. They have begun to form risk expectations based on individual rationality and pursue rational allocation of resources across different periods. Their consumption behavior was not only influenced by income levels but also by income uncertainty brought about by rural institutional changes during the economic transformation period ([Yi et al., 2012](#); [Tang and Guo, 2022](#)). The estimated coefficient of the impact of income uncertainty on the consumption level of rural residents in this stage is -0.065 , indicating that the incentive effect of the household contract responsibility system reaches the limit and the uncertainty of income growth brought about by the continuously exposed institutional defects has a significant negative impact on their consumption level.

In addition, although the implementation of the household responsibility contract system has greatly promoted the rapid growth of disposable income of rural households in China after the reform and opening-up, some consumption habits like extra thrift and precautionary savings could not be changed in the short term because they had been developed due to income stagnation for more than 20 years since the founding of the People's Republic of China ([Wu and Li, 2021](#)). The estimated coefficient of the impact of internal habit formation on the

consumption level of rural resident households during this stage is 0.609 and significant at the 1% level, reflecting that the “ratchet effect” of the internal habit formation in rural household consumption is significant. This also leads to a relatively stable improvement in the consumption level of rural households in China during this stage without significant fluctuations along with income growth.

4.3 Analysis of empirical results during overall well-off society construction stage

In 1992, the 14th National Congress of the Communist Party of China set the reform goals and basic framework of the socialist market economy system. A series of reforms were conducted in various areas such as finance, taxation, foreign exchange, banking, pricing, housing, social security systems, income distribution systems and so on. Since 1993, the government liberalized the free trade of grain and oil through abolishing the unified purchase and sale of grain and the system of grain tickets and oil tickets as well. Some other pilot reforms were also carried out on the household registration management of small towns and the employment management of rural labor mobility, which promoted the orderly transfer of rural labor force. From 1992 to 1998, the average annual migration of rural labor force in China was about 4.68 million. After 1998, due to the strategic adjustment of rural economic structure, more people were migrated (Zhou and Yang, 2009). So the wage income of rural residents increased rapidly with its proportion in net income getting higher and higher. By 2001, the per capita net income of Chinese rural residents reached 2,366 yuan with the Engel's coefficient dropping to 47.71%. China achieved the historic leap from subsistence to overall well-off. However, during the period from 1984 to the end of the 20th century when China shifted the focus of economic system reform to urban areas, the central government almost eliminated the investment in rural public services (Zhang, 2019). In addition, the motivational effect of the household contract responsibility system on agricultural production has reached its limit (Luo and Zhang, 1995), which gradually widens the urban–rural income gap. Based on provincial panel data from 1992 to 2001, the method of dynamic panel SYS-GMM is used to estimate the influencing factors of rural household consumption behavior (as shown in Table 3). The results show that during the overall well-off society construction stage, external habit formation and rural transportation infrastructure also have a significant impact on rural households consumption behavior in addition to those factors like per capita disposable income, income uncertainty and their internal habit formation. The driving factors that affect the evolution of consumption behavior of rural households in China during this stage have begun to shift from demand-side factors acting alone to the combined effects of demand-side and supply-side factors.

Firstly, the consumption of rural households in China is still characterized with the clear feature of income dependence during the overall well-off society construction stage. Owing to the reasons of the imbalance in urban–rural economic development, the slowdown in rural economic development and the rural residents' failure to increase income despite the increased production caused by market-oriented reforms (Wang C. Q. et al., 2020), the marginal consumption tendency of rural households has decreased from 0.516 to 0.227 compared to the subsistence stage with obvious characteristics of “consumption suppression.” Secondly, due to the weak income growth of rural

residents coupled with the lagging development of “agriculture, rural areas, and farmers” behind the rapid development of industrialization and urbanization as well as weak central government support for agriculture during this stage, the uncertainty faced by Chinese rural households has gradually increased compared to urban households, objectively making the rural residents more cautious in consumption and enhancing their motivation and willingness for precautionary saving (Chen, 2022). As a result, the impact of uncertainty on the consumption of rural households in China not only persists but also increases with the coefficient of influence rising from -0.065 in the subsistence stage to -0.148 in the overall well-off society construction stage. Thirdly, the consumption behavior of rural households in China demonstrated a significant internal habit formation effect during this stage and the coefficient of internal habit formation effect has increased from 0.609 to 0.744 compared with that in the subsistence stage, indicating that the influence of the past consumption habits on their consumption behavior was increasing and the inertia of internal consumption was increasing. This also supports the research conclusion proposed by scholars that the marginal propensity to consume and habit formation effects usually have a relation of “as one falls, another rises” (Hang, 2011). Fourthly, the consumption behavior of Chinese rural households demonstrated the significant effects of external habit formation during this stage, which was primarily due to the fact that urban residents imposed a significant “demonstrative” influence on the consumption behavior of rural residents with the separation between urban and rural product markets as well as factor markets eliminated after the socialist market economic system and the relaxation of rural labor transfer policies were established after 1992 (Liu, 2023). However, this influence was relatively weaker compared to the impact of internal habit formation effect. Finally, the construction of rural transportation infrastructure had a significant positive impact on Chinese rural households consumption during this stage. This was mainly due to the implementation of China's high-grade highway construction strategy in 1993, which promoted the rapid development of rural transportation infrastructure such as highways. As a result, it not only reduced inter-regional trade costs, promoted commodity circulation and enriched the supply of consumption goods in the rural markets (Aggarwal, 2018), but also effectively broke the spatial constraints of rural consumption growth (Shen et al., 2021), and boosted the domestic consumption demand of rural households.

4.4 Analysis of empirical results during all-round well-off society construction stage

With the entry into the World Trade Organization on December 11, 2001, China began to enter a new stage of comprehensively deepening reform and opening up and accelerating the socialist modernization to achieve an all-round well-off society. On one hand, Chinese government continuously reforms the wage system, improves the income distribution, and deepens the reform of the system in the fields of education, medical care, and elderly care. Thanks to these reforms, urban residents achieve rapid growth in income, and a full-coverage social security system is preliminarily built up (Xi, 2023). On the other hand, in order to promote the coordinated development of different regions as well as urban and rural areas, Chinese government actively adheres to the philosophy of sustainable and scientific

development and implements a series of major development strategies such as the Western Development, Urban–Rural Integration, Revitalization of Northeast China and so on (Chen et al., 2023). In particular, the No.1 Document of Central Government kept stressing the importance of the development in agriculture, rural areas and farmers for 18 consecutive years from 2004 to 2021, focusing on the increase of farmers' income, the construction of agricultural infrastructure, the integrated development of urban and rural areas, the development of modern agriculture, the reform of supply-side of agriculture, and the revitalization of the countryside. This not only provides a solid foundation for the sustained and stable growth of rural residents' income, but also provides institutional guarantee and policy support for the realization of agricultural modernization and the goal of all-round well-off society (Lan et al., 2023). In 2021, all rural poor people in China were lifted out of poverty with the per capita disposable income of rural households reaching CNY 18390.9 and the Engel's coefficient dropping to 32.67%. China has successfully built an all-round well-off society. Based on provincial panel data from 2002 to 2021, the method of dynamic panel SYS-GMM is used to estimate the influence factors of rural household consumption behavior (as shown in Table 3). The results show that all the factors like per capita disposable income, income uncertainty, habit formation, urbanization level, total dependency ratio, liquidity constraints, effective irrigation area of farmland and electricity consumption of rural households have significant impact on their consumption behavior during the all-round well-off society construction stage. This indicates that rural household consumption behavior in China during this phase is jointly influenced by both demand-side and supply-side factors, reflecting a more complex and interactive dynamic between these two dimensions.

Firstly, the consumption of rural households in China still demonstrates the feature of obvious income dependence during the all-round well-off society construction stage. However, because the policy system aimed at "supporting, strengthening, benefiting and enriching agriculture" is continuously implemented and improved, the income of rural households achieve long-term, stable, and high-speed growth (Wang and Wen, 2016). Compared with the overall well-off society construction stage, the marginal consumption tendency of rural households increases from 0.227 to 0.422 with their consumption willingness and potential released to a certain extent. Secondly, although the income growth of rural households at this stage has entered the fast lane once again after the reform and opening-up, their agricultural production income suffered significant risks due to multiple factors such as nature, market and system. Wage income is of great uncertainty because of those reasons like people's own quality and ability constraints and imperfect employment systems (Wang, 2020). Additionally, the uncertainty faced by rural households intensifies after the 1990s with the advancement of a series of reforms involving people's livelihood and interests including healthcare, education, housing, employment, and retirement etc. (Liu et al., 2022). Its impact coefficient changes from -0.148 in the overall well-off society construction stage to -0.275 in the all-round well-off society construction stage. Thirdly, the consumption of rural residents in China demonstrates significant habit formation effect during this stage, which is influenced by both the past consumption habits and the external demonstrative consumer groups. On one hand, the internal habit formation effect of rural residents' consumption falls from 0.744 to 0.559. To some extent, the formation of internal habits reflects the cautious motivation of residents to consume (Deaton, 1992).

Therefore, thanks to the weakening of income constraints, rural residents are less cautious in consumption motivation and lower in the intensity of internal consumption habit formation, and their dependence on past consumption gradually decreases. The long-term, stable, and high-speed growth of income further promotes the rural residents' consumption tendency. On the other hand, the external habit formation effect of rural residents' consumption decreases from 0.117 to 0.055, reflecting the gradually weakening influence of external demonstrative consumer groups on the consumption level of rural residents (Guo, 2022). Fourthly, the results of the seventh national population census in 2020 show that China's "demographic dividend" is diminishing gradually and the proportion of working-age population has significantly decreased during the all-round well-off society construction stage. With the adjustment effect of fertility policy, the proportion of children population rebounds slightly, while the proportion of the elderly population increases significantly in relevance to the former due to the continuous deepening level of aging population. In general, the age structure of China's population has gradually transformed from the feature of "vase shape" in 2000 to that of "barrel shape" in 2020 (Zhu and Zhang, 2021). Owing to the fact that children and the elderly populations usually correspond to negative savings (Zhang, 2011), a significant increase in total dependency ratio will inevitably have a positive promoting effect on consumption. Empirical results also prove that there is a significant positive correlation between the total dependency ratio of rural households and their consumption level. Fifthly, those factors like the outflow of rural savings fund to non-agricultural and non-rural areas coupled with imperfect rural credit systems, guarantee systems, credit products (Fang et al., 2011) lead to practical problems for rural households such as difficulty in obtaining loans, high interest rates and small loan limit, which results in their inability to smooth the consumption expenditure through credit based on reasonable expectations of future income (Tang and Guo, 2022). Liquidity constraints impose a significant negative impact on the consumption level of rural households. Sixthly, with the advancement of industrialization and the upgrading of industrial structure, the significant improvement of the urbanization level in China expedites the transfer of a large number of surplus rural labor to urban areas. Farmers who work in cities not only achieve the transition in their professions and identities but also transform their living situation from rural settlements to urban communities. Combined with abundant product supply and convenient consumption environment in urban areas, these factors ultimately impose a positive impact on the consumption level of rural households owing to income effects, population structure effects, and demonstration effects (Wan, 2021). Lastly, since entering the all-round well-off society construction stage, the central government has started to initiate the development strategy of "supplementing agriculture with industry and promoting rural areas with urban areas" and continuously issue 20 pieces of "No.1 Documents" focusing on the issues of agriculture, rural areas, and farmers. The "No.1 Document" of 2004 explicitly proposed shifting the focus of infrastructure construction from urban areas to rural areas. The new rural construction that was initiated in 2005 gradually solved the basic infrastructure problem of the availability of water, electricity, roads, gas, and broadband in all administrative villages. The rural revitalization strategic plan released in 2018 clearly proposed investing 7 trillion RMB within 5 years in rural transportation, environmental protection, water conservancy and other infrastructures as well as rural industrial projects such as deep processing of agriculture and animal husbandry products, modern agricultural industrial parks and

high-standard farmland construction. Therefore, in view of the effect of income, the construction and development of productive infrastructure increase the purchasing power of rural households, and the construction of living infrastructure can enhance the consumption ability of rural households by improving the consumption environment, reducing consumption costs and promoting urban–rural market integration (Wang, 2013). The results of empirical research also confirm that the construction and development of both productive infrastructures and living infrastructures have positive impact on the improvement of rural household consumption levels.

5 Research conclusions and policy responses

Based on provincial panel data from rural household surveys from 1978 to 2021, this paper constructs an econometric model for rural household consumption behavior and uses SYS-GMM estimation method to empirically study the motivators of the evolution of rural household consumption behavior in three different stages of China's well-off society construction practices since the reform and opening-up. The research results are demonstrated as follows. Firstly, in the subsistence stage, as the market increased the regulatory effect on economic activities, the rural residents in China began to form risk expectations from the individual rational perspective. However, since the consumption habits which had been developed in the past more than 20 years of income stagnation after the founding of the People's Republic of China could not be changed in the short term, their consumption behaviors were not only affected by income levels and uncertainty but also exhibited a significant “ratchet effect” of internal habit formation. Secondly, in the overall well-off society construction stage, because the socialist market economy system was established and the isolation between urban and rural product markets and factor markets were gradually broken, the consumption of rural households was influenced not only by income levels, uncertainty and internal habit formation but also significantly affected by external habit formation and rural infrastructure. Thirdly, thanks to the accelerated promotion of urban–rural integration coupled with the continuous deepening of aging and imperfect rural credit guarantee system in the all-round well-off society construction stage, the consumption of rural households is significantly influenced by those additional factors such as urbanization level, population structure and liquidity constraints in addition to income level, uncertainty, habit formation and infrastructure construction. In conclusion, rural household consumption in China undergoes a dynamic upgrading process characterized by continuous coordination and matching between supply-side and demand-side factors. Since the reform and opening-up, the primary drivers of the changes in rural household consumption behavior have turned from pure demand-side factors to the synergistic interplay between supply-side and demand-side factors.

In the context of global economic slowdown with challenges to economic globalization, the pure reliance on either “demand-side management” or “supply-side structural reforms” cannot fully activate the consumption momentum of Chinese rural households, nor can it continue to play the role of an engine for stimulating rural consumption. Only guided by the rule of improving life quality and comprehensive development of rural residents and based on the actual situation of Chinese rural households, can we take the right path of supporting both

supply-side and demand-side structural reforms as well as the coordination of policies of supply and demand so as to promote forming a higher-level dynamic balance with demand driving supply and supply creating demand. Ultimately the domestic circulation can be effectively stimulated to meet the growing needs of people for a better life. Policy recommendations for stimulating rural consumption in China are as follows. First, Chinese government should adapt to the trend of rural household consumption upgrading, accelerate supply-side structural reform and policy adjustment, and enrich the supply of rural consumption from multiple perspectives, so as to improve the adaptability of supply. Second, Along with the full application of information technology such as the Internet, artificial intelligence, and the Internet of Things, new consumption should be stimulated to play a leading role in driving enterprise innovation and industry upgrading so that the rural consumer market supply system can be continuously innovated. Third, Chinese government should build a high-standard unified market to create a fair, orderly, efficient and standardized market competition environment so as to promote the effective integration of production, distribution, circulation, consumption and other links, reduce transaction costs, and break through supply constraints. Fourth, Chinese government should fully leverage the market role in allocating resources, continuously improve the supply system in rural markets, and improve the improper rural consumption environments such as the lagging infrastructure, unsound logistics system, and the lack of standardized circulation order. Fifth, Chinese government should continuously broaden the channels for rural residents to increase their income by improving the employment and income increase policy, upgrading the organizational degree of agricultural industrialization, and optimizing the redistribution adjustment mechanism. Sixth, Chinese government should improve three major social security projects of rural medical care, elderly care and minimum living security, and optimize rural social assistance system, so as to reduce the uncertainty of future expenditure of rural households and enhance consumption confidence and willingness. Seventh, Chinese government should improve and implement the portfolio of special support policies and various policy incentives to expand rural consumption, so as to solve the problem of insufficient incentives for rural residents to increase their level of consumption.

Data availability statement

Publicly available datasets were analyzed in this study. This data can be found at: <https://www.stats.gov.cn/sj/> and <https://www.epsnet.com.cn/index.html#/Index>.

Author contributions

ZT: Funding acquisition, Project administration, Resources, Supervision, Writing – original draft, Writing – review & editing. XB: Data curation, Methodology, Visualization, Writing – original draft. YT: Validation, Visualization, Writing – review & editing.

Funding

The author(s) declare that financial support was received for the research, authorship, and/or publication of this article. This is a part

research accomplishment of the project “Research on the Evolution of Rural residents’ Consumption Behavior and the Coordinated Policy of Supply and Demand in the Past Forty Years of Reform” (No. 18BJL004),” which is supported by Office of Chinese Philosophy and Social Sciences. Graduate Innovation Program at Yangzhou University School of Business, grant number SXYYJSKC202428.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

References

- Aggarwal, S. (2018). Do rural roads create pathways out of poverty? Evidence from India. *J. Dev. Econ.* 133, 375–395. doi: 10.1016/j.jdeveco.2018.01.004
- Arellano, M., and Bond, S. (1991). Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. *Rev. Econ. Stud.* 58, 277–297. doi: 10.2307/2297968
- Arellano, M., and Bover, O. (1995). Another look at the instrumental variable estimation of error-components models. *J. Econ.* 68, 29–51. doi: 10.1016/0304-4076(94)01642-D
- Baudrillard, J. (2000). The consumer society. ChengfuLiuZhigangQuan (Trans.). Nanjing: Nanjing University Press.
- Blundell, R., and Bond, S. (1998). Initial conditions and moment restrictions in dynamic panel data models. *J. Econ.* 87, 115–143. doi: 10.1016/S0304-4076(98)00009-8
- Chen, C. (2011). Population structure changes and rural resident consumption: based on the life-cycle hypothesis theory. *J. Agrotech. Econ.* 4, 25–32. doi: 10.13246/j.cnki.jae.2011.04.004
- Chen, C. (2014). Measurement of income uncertainty and its impact on the consumption behavior of rural residents. *Econ. Sci.* 2014, 46–60. doi: 10.19523/j.jkx.2014.03.004
- Chen, T. M. (2022). Economic fluctuations, precautionary saving motive and excess sensitivity of consumption. *Stat. Res.* 39, 33–48. doi: 10.19343/j.cnki.11-1302/c.2022.04.003
- Chen, M. X., Wang, C. J., Cheng, J. F., and Ma, J. (2023). Chinese path to modernization and new pattern of regional development in China. *Econ. Geogr.* 43, 20–26. doi: 10.15957/j.cnki.jjdl.2023.07.003
- Cui, H. Y., and Fan, J. Z. (2011). Internal and external habit formation and consumption behavior of rural residents in China: an empirical analysis based on provincial dynamic panel data. *Chin. Rural Econ.* 7, 54–62.
- Cui, H. Y., and Hang, B. (2014). Income difference, habit formation and consumption behavior of urban households in China. *J. Indust. Eng. Eng. Manag.* 3, 135–141. doi: 10.13587/j.cnki.jieem.2014.03.018
- Deaton, A. (1992). Understanding consumption: Oxford University Press.
- Demurger, S. (2001). Infrastructure and economic growth: an explanation for regional disparities in China. *J. Comp. Econ.* 29, 95–117. doi: 10.1006/jcec.2000.1693
- Duesenberry, J. (1949). Income, saving and the theory of consumer behavior. Cambridge, MA: Harvard University Press.
- Easterlin, R. A. (1974). “Does economic growth improve the human lot? Some empirical evidence” in Nations and households in economic growth eds. David, P. A., and Reder, M. W. (Academic Press), 89–125.
- Fang, S. H., Wang, W. N., and Huang, H. Q. (2011). A study on the increase in peasants’ income and on the policy for enlarging consumption in villages. *J. Manag. World* 5, 66–82. doi: 10.19744/j.cnki.11-1235/f.2011.05.005
- Feng, X. Y., and Liu, Z. (2008). The impact of consumption environment on rural residents’ consumption: taking rural power grid transformation as an example. *Agric. Econ. Issues* 6, 80–84.
- Frank, R. H., Levine, A. S., and Dijk, O. (2014). Expenditure cascades. *Rev. Behav. Econ.* 1, 55–73. doi: 10.2139/ssrn.1690612
- Gao, H. W., and Zhang, Y. S. (2015). Tracing the origins of urbanization theory and the essence of China’s new urbanization. *Contemp. Econ. Res.* 5, 61–66.
- Geng, Y. Q. (2012). An empirical analysis in the effect of consumption environment on rural residents’ consumption. *Stat. Res.* 11, 36–40. doi: 10.19343/j.cnki.11-1302/c.2012.11.006
- Guo, Q. Y. (2003). Changes in consumption behavior and choice of macro-economic policy. *J. Xiamen Univ.* 1, 41–49.
- Guo, S. X. (2022). Rural residents’ consumption behavior, influencing factors and development suggestions. *Issues Agric. Econ.* 5:2. doi: 10.13246/j.cnki.iae.2022.05.008
- Hang, B. (2011). Rational habit preference and consumption behavior. *Stat. Res.* 3, 23–29. doi: 10.19343/j.cnki.11-1302/c.2011.03.004
- He, L. L., and Wang, F. (2018). An empirical analysis of the impact of inflation on urban residents’ consumption expenditure. *Bus. Econ. Res.* 9, 41–44.
- Hirsch, F. (1976). Social limits to growth. Cambridge, MA: Harvard University Press.
- Hong, Y. X. (2010). Marx’s theory of consumption power and the expansion of consumer demand. *Econ. Perspect.* 3, 10–13.
- Hu, Y. (2009). The constraint of urban-rural income gap on rural residents’ consumption demand in China. *J. Jiangxi Univ. Finan. Econ.* 4, 33–35.
- Knight, F. H. (2005). Risk, uncertainty and profit (WangY.WangW., Trans.). Beijing: China Renmin University Press.
- Lan, H. X., Wang, T. Y., and Shi, D. B. (2023). Chinese path to agricultural and rural modernization: generative logic, connotation characteristics and promotion strategies. *Reformation* 7, 105–115.
- Lei, Q. L. (2009). Wealth accumulation, habits, preference changes, uncertainty and consumption decisions. *China Econ. Quart.* 2009, 1029–1046.
- Lei, Q. L. (2013). Price change, family expenditure structure and consumer behavior of urban residents in China. *Finan. Trade Econ.* 5, 105–114. doi: 10.19795/j.cnki.cn11-1166/f.2013.05.013
- Li, C. Z., and Qiu, J. J. (2012). Research on demographic structure and household consumption in rural China. *Populat. Econ.* 1, 49–56.
- Liu, H. (2023). Rural life modernization: consumption space transformation from the perspective of urban-rural integration. *Soc. Sci. Res.* 3, 124–132.
- Liu, X. J., and Dai, J. S. (2012). The evolving relationship between rural residents’ consumption and economic growth: a case study of rural life in Xinjiang since the reform and opening up. *Consum. Econ.* 28, 35–38, 43.
- Liu, L. Z., Pan, Y., and Wang, Y. P. (2022). Analysis of the impact of uncertainty factors on rural residents’ consumption: an empirical test on rural residents in Hubei Province. *J. Agrotech. Econ.* 12, 61–68. doi: 10.13246/j.cnki.jae.2011.12.012
- Long, S. B., and Zhang, R. (2021). Research on the influence of consumption environment improvement on residents’ consumption potential: based on the current surplus consumption potential perspective. *Statist. Inform. Forum* 1, 79–89.
- Luo, Y. S., and Zhang, H. Y. (1995). Agricultural land system innovation after the household responsibility system. *Econ. Res. J.* 1, 69–80.
- Mansfield, E. (1992). Microeconomics: Theory and applications. Beijing: China Financial Publishing House.
- Modigliani, F., and Brumberg, R. (1954). Utility analysis and the consumption function: an interpretation of cross-section data. *J. Post Keynesian Econ.* 1, 388–436.
- Ouyang, P., Jiang, X., and Xie, Y. (2021). The impact of consumption environment on rural consumption upgrading in China: a system GMM analysis based on provincial dynamic panel data. *Bus. Econ. Res.* 1, 31–35.
- Qi, H. Q., and Li, Z. C. (2018). Time-varying effect of rural financial development on rural consumption in China. *J. Agrotech. Econ.* 3, 110–121. doi: 10.13246/j.cnki.jae.2018.03.009

Generative AI statement

The author(s) declare that no Gen AI was used in the creation of this manuscript.

Publisher’s note

All claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated organizations, or those of the publisher, the editors and the reviewers. Any product that may be evaluated in this article, or claim that may be made by its manufacturer, is not guaranteed or endorsed by the publisher.

- Ren, B. P., and Miao, X. Y. (2021). The path and policy orientation of expanding new consumption demand under the background of new economy. *Reformation* 3, 14–25.
- Roodman, D. (2009). How to do xtabond2: an introduction to difference and system GMM in Stata. *Stata J.* 9, 86–136. doi: 10.1177/1536867X0900900106
- Schultz, T. P. (1985). School expenditures and enrollments, 1960–1980: The effects of income, prices and population, population growth and economic development. Madison, WI, USA: University of Wisconsin Press.
- Shen, Y., Guo, J. H., and Cheng, R. (2021). Can the improvement of transportation infrastructure promote consumption of residents? Evidence from the opening of high-speed rail. *J. Bus. Econ.* 1, 59–72. doi: 10.14134/j.cnki.cn33-1336/f.2021.01.006
- Stiglitz, J. E., and Weiss, A. (1981). Credit rationing in markets with imperfect information. *Am. Econ. Rev.* 71, 393–410.
- Sun, F. (2002). Uncertainty analysis of Chinese residents. *Nankai Econ. Stud.* 2, 58–63.
- Tan, S. (2021). The multi-dimensional judgment standards for insufficient consumption power in China. *J. Northwest Minzu Univ.* 5, 131–138. doi: 10.14084/j.cnki.cn62-1185/c.20210906.001
- Tang, B. W., and Guo, J. (2022). How to expand rural domestic demand: from the perspective of rural household consumption. *Issues Agric. Econ.* 3, 73–87. doi: 10.13246/j.cnki.iae.20220301.001
- Tian, G. (2004). An empirical analysis of the high saving behavior of rural residents in China: a precautionary savings model with liquidity constraints and its test. *Nankai Econ. Stud.* 4, 67–74.
- Wan, Y. B. (2021). The evolution trend of rural consumption in the process of rapid urbanization and its countermeasures. *Soc. Sci.* 10, 77–83. doi: 10.19863/j.cnki.issn.1002-3240.2020.10.013
- Wan, G. H., Zhang, Y., and Niu, J. G. (2001). Liquidity constraints, uncertainty and household consumption in China. *Econ. Res. J.* 11, 35–44.
- Wang, J. Y. (2010). Research of the calculation method of income uncertainty. *Stat. Res.* 9, 58–64. doi: 10.19343/j.cnki.11-1302/c.2010.09.009
- Wang, X. N. (2013). The consumption effect of China's rural infrastructure construction. *J. Xi'an Univ. Finan. Econ.* 3, 72–76. doi: 10.19331/j.cnki.jxufe.2013.02.014
- Wang, B. J. (2014). Rural institutional change, liquidity constraint and consumption growth of rural residents in China. *J. Shanxi Univ. Finan. Econ.* 10, 1–10. doi: 10.13781/j.cnki.1007-9556.2014.10.012
- Wang, J. (2020). An empirical test of the impact of income uncertainty on rural residents' consumption demand. *Stat. Decis.* 6, 123–126. doi: 10.13546/j.cnki.tjyc.2020.06.028
- Wang, K. W., Li, J. Q., and Xu, H. Q. (2013). Research on the impact of uncertainty on the consumption behavior of rural residents in China: a dual perspective of consumption uncertainty and income uncertainty. *Econ. Sci.* 2013, 88–96. doi: 10.19523/j.jjkk.2013.05.008
- Wang, C. Q., Li, L., and Xue, H. Y. (2020). The influence of population age structure and basic old-age insurance for Urban and rural residents on rural Residents' consumption rate—based on the empirical analysis of China's provincial panel data from 2010 to 2017. *Soc. Secur. Stud.* 3, 85–93.
- Wang, X. H., and Wen, T. (2016). Theoretical basis, accumulation effect and policy implications in extraordinary income growth for Chinese farmers. *J. Southwest Univ.* 1, 55–63. doi: 10.13718/j.cnki.xdsk.2016.01.008
- Wang, X. H., Wen, T., and Han, L. S. (2020). Habit formation and the evolution of consumption behavior among Chinese farmers: empirical evidence since the reform and opening up. *China Rural Econ.* 1, 17–35.
- Wang, J. Y., and Xu, H. Q. (2010). Impact of income uncertainty on Farmers' consumption. *Contemp. Econ. Sci.* 32, 54–60.
- Wang, H. J., and Zhang, H. L. (2002). The impact of uncertainty and liquidity constraints on Chinese residents' consumption behavior. *Econ. Sci.* 6, 22–28. doi: 10.19523/j.jjkk.2002.06.003
- Windmeijer, F. (2005). A finite sample correction for the variance of linear efficient two-step GMM estimators. *J. Econ.* 126, 25–51. doi: 10.1016/j.jeconom.2004.02.005
- Wu, X. P., and Li, R. X. (2021). The dynamic effects of consumption habits and the choice of macroeconomic policy among rural residents in China: a perspective based on panel ELES models in different income regions. *Macrocon. Res.* 5, 92–103, 169. doi: 10.16304/j.cnki.11-3952/f.2021.05.009
- Xi, H. (2023). The goal and task of common prosperity and the enabling path of social security. *Frontiers* 3, 68–76. doi: 10.16619/j.cnki.rmltxsqy.2023.03.009
- Xie, L. H., and Wei, G. X. (2022). The situation of and suggestions on expanding consumer demand in rural areas during the 14th "five-year plan" period. *Macrocon. Manag.* 4, 40–46. doi: 10.19709/j.cnki.11-3199/f.2022.04.012
- Xu, Y. D., and Zhang, Y. L. (2021). The impact of urban-rural income disparity on rural residents' consumption: "inhibition effect" or "demonstration effect"? *Rural Econ.* 8, 18–28.
- Yi, M. J., Tai, X. J., and Zhang, Z. (2012). The potential of the rural consumer market: an analysis based on consumption trends from 1978 to 2010. *Explorat. Econ. Issues* 4, 68–72.
- Yi, X. J., Wu, Q. Y., and Yang, B. Y. (2013). The income effect and demonstration effect of urbanization on rural inhabitant average propensity to consume in China: 2000–2009. *Econ. Surv.* 5, 66–70. doi: 10.15931/j.cnki.1006-1096.2013.05.011
- Yu, Y., Qian, Q., and Wang, Y. T. (2015). Influences on the residents' consumption by China's urbanization and population aging. *Urban Issues* 10, 69–73. doi: 10.13239/j.bjshkxy.cswt.151011
- Zhang, Y. Z. (2011). An empirical analysis of Henan rural population age structure on the impact of consumption. *Populat. Econ.* 5, 75–79.
- Zhang, H. P. (2019). The evolution of China's urban-rural relations in the past seven decades: from separation to integration. *China Rural Econ.* 3, 2–18.
- Zhang, Y. C., and Dai, R. X. (2018). Influence of rural infrastructure on the economic growth of agriculture—an empirical analysis based on national provincial panel data. *J. Agrotech. Econ.* 3, 90–99. doi: 10.13246/j.cnki.jae.2018.03.007
- Zhang, Y. B., and Tu, S. W. (2022). The path and countermeasures to expand rural consumption under the construction of new development paradigm. *Macrocon. Res.* 11, 54–66. doi: 10.16304/j.cnki.11-3952/f.2022.11.003
- Zheng, C. D. (2007). An empirical study of the relationship between population structure and savings ratio in different regions. *Populat. Econ.* 6, 1–11.
- Zhou, J., and Yang, X. Z. (2009). China's rural consumption behavior changes and rural-urban mechanism. *Econ. Res. J.* 1, 83–96.
- Zhu, Y. L., and Zhang, B. (2021). The future trend of China's consumption under the change of demographic structure—analysis based on the data of the seventh national census. *J. Shaanxi Normal Univ.* 7, 149–163. doi: 10.15983/j.cnki.sxss.2021.0722