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Research on the impact of online shopping on household consumption structure

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Abstract: *Consumption has become increasingly important to China's economic growth amid the impact of the epidemic and the turmoil in the world economy. With the rapid development of Internet technology in China, online shopping has gradually become the main form of residents' consumption, which plays an important role in the consumption structure. Based on Chinese household tracking survey data, this paper quantitatively analyzes the impact of online shopping on household consumption structure. The measurement results show that the total household consumption of households that use online shopping is 41% higher than that of households that do not use online shopping, and the use of online shopping has a greater effect on rural household consumption than urban household consumption. The use of online shopping has a significant positive effect on six types of consumption: food consumption, cultural, educational and entertainment consumption, clothing, shoes and hats consumption, household equipment and daily necessities consumption, residential consumption, and transportation and communication consumption. The impact on healthcare consumption is negative and minimal.*

Keywords: *online shopping, household consumption, Internet*

1. Introduction

The outbreak of the novel coronavirus pneumonia in 2020 has had a profound and extensive impact on the global economy, and the world is experiencing major changes unseen in a century. The impact of the epidemic and the trend of anti-globalization have brought new challenges to China's future economic development. Based on the new international environment and strategic layout, the central government deeply analyzed the trend of world economic development and the unique characteristics of China's economy, and proposed to build a "new development pattern with domestic circulation as the main body and domestic and international dual circulation promoting each other". In order to promote the establishment of this new development pattern as soon as possible, the meeting of the Political Bureau of the CPC Central Committee pointed out that the expansion of domestic demand should be taken as a strategic base point. Expanding domestic demand can enhance the autonomy and sustainability of a country's economic development. In the context of the turbulent world economic situation, expanding domestic demand has gradually become the key to the sustainable and healthy development of a country's economy. As a result, consumer demand will play an increasingly important role in China's economic growth.

From a theoretical point of view, the consumption structure mainly reflects the specific content of consumer demand. If you want to increase the consumption demand of a country's residents, you must first conduct an in-depth study of the consumption structure of the country's residents. Only by grasping the evolution trend and direction of residents' consumption demand can we formulate corresponding policies in a targeted manner, create a high-quality consumption environment for consumers, promote consumers to increase consumption, and realize the coordinated development of industrial structure and consumption structure.

2. Literature Review

The structure of household consumption has always been an important topic in academic research, and relevant scholars have studied it from different aspects. The following is a review of the impact of the Internet, income, demographics and prices on household consumption structure.

The impact of the Internet on household consumption structure. With the development of Internet

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technology, many scholars have begun to study the impact of the Internet on household consumption structure. Firstly, Yang et al. (2018)[1] showed that there is a positive correlation between Internet use and total household consumption. Among them, the use of the Internet has a significant promotion effect on food, clothing and entertainment consumption, but the impact on medical consumption is not significant. Secondly, Liu and Zhang (2016)[2] selected China's provincial panel data from 2003 to 2013 to study the relationship between Internet development and rural residents' consumption structure. The empirical results show that the impact of Internet development on rural residents' consumption is positive. Among them, the popularization of mobile phones has great driving potential for the transformation of rural residents' consumption structure from traditional to enjoyment. Finally, Hu (2019)[3] studies the impact of Internet finance on household consumption structure. She believes that the development of Internet finance has had a huge impact on China's economic industry and residents' consumption structure. Its research shows that there are two main paths for the impact of the development of Internet finance on consumption: on the one hand, the development of Internet finance provides new consumption channels and payment methods, thereby promoting consumption; On the other hand, the development of Internet finance has prompted residents to reduce current consumption by providing lending facilities. Specifically, the comprehensive effect of the development of Internet finance on different types of consumption is also different. Research by Zhao and Gai (2020) [4]shows that the development of Internet consumer finance has a greater role in promoting residents' development of enjoyment consumption expenditure than on residents' basic subsistence consumption expenditure. The development of Internet consumer finance has a positive impact on the optimization of domestic consumption structure(Li et al.,2020;Jiang et al.,2024)[5][6].

The impact of income on household consumption structure. In the past analysis of household consumption structure, the biggest impact on household consumption structure is income. In general, the higher the household income, the higher the various levels of consumption. Chen and Wang (2020)[7] show that the decline in income growth of middle-income groups has a significant negative impact on household consumption. Krueger and Perri (2006)[8] show that the recent increase in income inequality in the United States has not led to an increase in consumption inequality in the United States. They argue that this is because the effect of income on consumption varies between income groups. Xu er al. (2021)[9] show that in China, the comprehensive impact of urban-rural income gap on total household consumption depends on the degree of gap between urban and rural income in the current period and the degree of gap between urban and rural residents' consumption income elasticity. Li and Jiang (2015)[10] explore the impact of persistent income on household consumption. Studies show that the effect of persistent income on consumption is much greater than that of temporary income and existing household assets, while uncertain income has obvious negative effects on household consumption. Low- and middle-consumption households are more sensitive to income changes than high-consumption households. Research by Zang and Chen (2019)[11] shows that households with different income types have different consumption habits and styles. Research by Chen and Li (2013)[12] shows that if high-income households like a commodity more than low-income households, the proportion of consumption expenditure on such goods is positively correlated with the widening of income gap.

The impact of population structure on household consumption structure.Song and Lu (2020)[13] show that the influence of population structure on economic growth is stronger than the effect of total population on economic growth. Ni et al.(2014)[14] used CHIPS data to empirically analyze the relationship between household demographic structure and consumption structure. The study found that both urban and rural households obeyed Engel's theorem in their consumption of food, and the proportion of food consumed decreased with the increase of income. The proportion of medical expenditure of elderly families is higher than that of young families, and the proportion of clothing and education is lower than that of young families. A study by Cao and Ran (2020)[15] on the population structure and consumption structure of Shanghai shows that middle-aged people have the greatest impact on the structure of consumption expenditure, and the age structure of the population has the greatest impact on food consumption expenditure. Li and Zhang (2009)[16] found that the ratio of children to children and the ratio of old age have obvious inhibitory effects on rural household consumption. They believe that this is because rural families want their children to invest heavily in education through learning to change their lives. In addition, in order to prevent accidental expenses in rural households, the elderly in the family and children with an increased burden of old-age care will reduce consumption.

The impact of price on household consumption structure.Chen (2013)[17] found that urban residents' expenditure on food, services and household equipment and supplies is not greatly affected by price fluctuations, while residential consumption expenditure, medical supplies expenditure and clothing consumption expenditure are greatly affected by prices. Ma et al.(2010)[18] studied the impact of pork prices on household consumption expenditure, and found that pork prices were significantly negatively

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correlated with household consumption expenditure, but not for urban households. Qu et al.(2012)[19] conducted research on food price stickiness, service price stickiness and industrial consumer goods price stickiness, among which the price stickiness of the service industry was the highest. Niu (2020)[20] studied the relationship between housing prices and household consumption, and found that the overall rise in housing prices in China has a negative impact on household consumption, among which the impact on household consumption in the central economic belt is stronger than that in the eastern economic belt. Xie (2019)[21] found that the relationship between asset price fluctuations and household consumption upgrading is positive, but the relationship is different between asset holders and unholders.

With the development of Internet technology, there is a new form of consumption of online shopping, and the emergence of online shopping has made the consumer market break through the limitations of space and improve people's consumption convenience. In the future, online shopping is expected to become the first driving force for the upgrading of consumption structure, and efficiently promote the upgrading of residents' consumption structure. At present, most of the academic research on household consumption structure starts from the aspects of population, price, and income. There are few studies on the topic of the impact of online shopping on household consumption structure, and this effect needs to be tested empirically by data. In addition, studying the problem of household consumption structure from the perspective of online shopping is conducive to providing new ideas and new ways to expand domestic demand.

3. Data source and Empirical analysis

The data used in this article are from Chinese Family Panel Studies (CFPS). The sample of Chinese Family Panel Studies covers 25 provinces and cities across the country, with a sample size of 14,960 households, tracking and collecting data at the three levels of individual, family and society. Chinese Family Panel Studies has been conducted in six phases: 2010, 2012, 2014, 2016, 2018 and 2020. The 2012 questionnaire did not address questions about online shopping. In the 2010, 2014, and 2016 data, there is no comprehensive definition of the head of household, but instead several concepts related to the definition of the head of household are defined. The 2014 questionnaire defined decision makers, financial managers and property owners, and the decision makers for that year were determined by the key decision makers in spending allocation, savings, investments, insurance, home ownership, child care and the purchase of high-priced consumer goods. These different aspects of the decision-maker may be different, so there may be more than one decision-maker in 2014. Financial managers and property owners were defined in 2016. The approximate definitions of heads of household in 2010, 2014 and 2016 are one-sided and all from one aspect. And there is no uniform definition of the head of the household in the past three years. The 2018 questionnaire defines the most appropriate respondents to the questionnaire. Since the questionnaire involves all aspects of the family, the most suitable person to answer the questionnaire is the definition obtained after comprehensive consideration of various aspects, which can better represent the real head of the household. In addition, in 2020, only individual-level questionnaire data were available, and no family-level related questions were addressed. Therefore, this paper only selects the data of the 2018 China Household Tracking Survey.

This paper divides household consumption into seven types: food consumption, cultural, educational and entertainment consumption, clothing, shoes and hats consumption, household equipment and daily necessities consumption, residential consumption, healthcare consumption, and transportation and communication consumption. The main explanatory variables in this paper are total household consumption and various types of household consumption, and logarithmic treatment is required according to the research needs. The main explanatory variable in this paper is the use of online shopping. In addition, a series of control variables are introduced, mainly the gender of the head of the household, the education level of the head of the household, the age of the head of the household, the marital status of the head of the household, and the size of the household. Specific variables and statistical descriptions are shown in Table 1 and Table 2 below.

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Table 1: List of variables

Variables	Code	Description
Total household consumption	total	Total annual household consumption expenditure
Food consumption	food	Annual household expenditure on food consumption
Cultural, educational and entertainment consumption	enter	Annual household expenditure on cultural, educational and entertainment consumption
Clothing, shoes and hats consumption	dress	Annual household expenditure on clothing, shoes and hats consumption
Household equipment and daily necessities consumption	daily	Annual household expenditure on household equipment and daily necessities consumption
Residential consumption	house	Annual household expenditure on residential consumption
Healthcare consumption	med	Annual household expenditure on healthcare consumption
Transportation and communication consumption	traf	Annual household expenditure on transportation and communication consumption
Online shopping usage	net	1 if online shopping exists in the household and 0 if online shopping does not exist
Gender of householder	gender	If the gender of the head of household is male, it is 1, and if it is female, it is 0
The education level of householder	educ	From 1 to 7, they represent illiterate/semi-literate, elementary school, middle school, high school, junior college, Bachelor's and master's
Age of householder	age	Age of householder
Marital status of householder	marry	1 if married, 0 if otherwise
household size	size	family population

Table 2: Decriptive statistics

	(1)	(2)	(3)	(4)	(5)
VARIABLES	N	mean	sd	min	max
daily	13,091	9,319	33,473	0	1.534e+06
dress	13,398	3,195	5,409	0	150,000
enter	13,442	6,614	13,050	0	256,000
food	13,536	19,903	18,829	0	480,000
house	13,223	10,335	31,811	0	548,000
med	13,495	6,160	15,800	0	389,000
traf	13,317	5,459	6,981	0	123,600
total	12,339	61,362	71,364	0	1.820e+06
size	13,631	3.582	1.922	1	21
net	13,631	0.541	0.498	0	1
gender	13,631	0.510	0.506	-9	1
educ	13,631	2.789	1.433	-8	8
marry	13,631	0.791	0.407	0	1
age	13,631	50.13	33.45	2	2,027

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This paper mainly uses data to empirically test the impact of online shopping on household consumption structure. In addition to the control variables mentioned above, add the provincial fixed effect and construct the econometric model as follows:

$$Consumption_i = \alpha + \beta_1 net + \beta_2 gender + \beta_3 educ + \beta_4 hukou + \beta_5 age + \beta_6 marry + \beta_7 size + \beta_8 province_i + \mu \quad (1)$$

The first column of Table 3 reports the regression of online shopping use to total household consumption. Online shopping usage has a significant positive impact on total household consumption, with households using online shopping increasing their total household consumption by 41.4% compared to households not using online shopping. The influence of other control variables on total household consumption was also significant, with male-headed households consuming 6.23% lower than female-headed households. Each additional year of age of the head of household will reduce total household consumption by 0.08%; For each additional person in the household, total household consumption will increase by 10.9%; For each level of education of the head of household, the total household consumption will increase by 19.2%; Married households spend 27.4% more than other types of households. However, these effects are smaller than the impact of online shopping use on total household consumption, and the impact of online shopping use on total household consumption is the main one. The impact of online shopping on consumption is mainly through the following two channels: First, online shopping home consumption provides a more convenient new form, anytime and anywhere as long as there is an Internet to consume, and people can save the trouble of physical shopping to transport goods home. Secondly, with the development of technology, people can obtain multiple information at low cost on the Internet, and can obtain various relevant information about products on the Internet through AR experience, view pictures, watch videos, browse buyer evaluations and evaluations, etc.

Table 5 reports the impact of online shopping use on household consumption in both urban and rural areas. Whether in urban or rural areas, the use of online shopping can significantly promote household consumption. Compared with the coefficient of the impact of online shopping on household consumption in urban and rural areas, it can be seen that the use of online shopping has a greater effect on household consumption promotion in rural areas. In urban areas, households that used online shopping increased their total spending by 37.6% compared to those who did not. In rural areas, households using online shopping spent 41.1% more than households not using it. This is related to the convenience of offline consumption in rural areas and urban areas.

The other columns in Table 3 and Table 4 report the return of online shopping consumption to food consumption, cultural, educational and entertainment consumption, clothing, shoes and hats consumption, household equipment and daily necessities consumption, residential consumption, healthcare consumption and transportation and communication consumption. The use of online shopping has a significant positive effect on six types of consumption: food consumption, cultural, educational and entertainment consumption, clothing, shoes and hats consumption, household equipment and daily necessities consumption, residential consumption, and transportation and communication consumption. The impact on healthcare consumption is negative and minimal. Households that use online shopping have only 7.11% lower healthcare spending than those who do not use online shopping. Healthcare consumption is not a daily consumption expenditure or a enjoyment consumption expenditure, medical consumption will only be carried out when there is a problem with the general physical condition, and online medical supplies are still controlled by the state. Therefore, on the whole, the use of online shopping has less impact on healthcare consumer spending.

The use of online shopping had the greatest impact on household equipment, daily necessities consumption and transportation and communication consumption, with regression coefficients of 70.1% and 55.8%, respectively. Even if households that use online shopping are 70.1% higher than those who do not use online shopping, spending on household equipment and daily necessities increased by 55.8%. For food consumption, clothing, shoes and hats, residential consumption and cultural, educational and entertainment consumption, households that use online shopping increase their food consumption by 32.5%, clothing and footwear consumption by 51.5%, residential consumption by 34.4%, and cultural, educational and entertainment consumption by 51.9% compared with households that do not use online shopping. Online shopping increases residents' willingness to consume by making information dissemination and shopping more convenient, thereby improving consumption levels.

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Table 3: Regression results of online shopping for different types of consumption

	lntotal	lnfood	lnenter	lndress
net	0.414***	0.325***	0.519***	0.515***
	(0.0155)	(0.0165)	(0.0351)	(0.0201)
controls	YES	YES	YES	YES
Provincial fixation effect	Yes	Yes	Yes	Yes
N	12,333	13,474	9,149	12,589
R^2	0.346	0.304	0.112	0.278

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 4: Regression results of online shopping for different types of consumption (continued)

	lndaily	lnhouse	lnmed	lntraf
net	0.701***	0.344***	-0.0711**	0.558***
	(0.0280)	(0.0224)	(0.0290)	(0.0186)
controls	YES	YES	YES	YES
Provincial fixation effect	Yes	Yes	Yes	Yes
N	12,895	13,023	11,980	13,083
R^2	0.224	0.140	0.053	0.321

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 5: Regression results of online shopping use for different types of household consumption

	lntotal in rural areas	lntotal in urban areas
net	0.411***	0.376***
	(0.0222)	(0.0216)
controls	YES	YES
Provincial fixation effect	Yes	Yes
N	5,948	6,216
R^2	0.298	0.327

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

4. Discussion and Conclusion

Based on the 2018 data of the China Household Tracking Survey, this paper examines the impact of online shopping use on total household consumption and various types of consumption. The main conclusions are as follows:

The use of online shopping has a significant role in promoting household consumption, and this effect has a great impact on the total household consumption. Among them, the use of online shopping has a greater role in promoting rural household consumption than urban household consumption. The state

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should continue to strengthen the construction of information infrastructure in various regions, continue to promote the improvement of logistics construction coverage, continue to increase Internet publicity and education, and increase the utilization rate of online shopping.

The use of online shopping has a significant positive effect on six types of consumption: food consumption, cultural, educational and entertainment consumption, clothing, shoes and hats consumption, household equipment and daily necessities consumption, residential consumption, and transportation and communication consumption. The impact on healthcare consumption is negative and minimal. The use of online shopping has the greatest impact on the consumption of household equipment, daily necessities and transportation and communication. The state should further strengthen the improvement of virtual information and real world integration technology, so that consumers can obtain more forms of information through the Internet. By improving the network experience of goods, it will better enhance residents' willingness to consume and increase the amount of various types of consumption.

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