

Discussion on the Role of Postgraduate Education Development in Expanding Consumption in China

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Abstract

Through the ages, a better life has always been the pursuit of all people. With the increase of the knowledge that people learn, people's consumption concept will also change. With the economic development of our country, the overall level of social education has been greatly improved, the national undergraduate program is no longer a dream we are moving toward the road of national graduate students. This paper uses financial knowledge and focuses on the growth of the number of graduate students in the past ten years and the change of the consumption level of residents in the past ten years, the development of graduate education has promoted the change of people's consumption concept, and the cost of graduate education itself has also promoted the expansion of consumption, thus stimulating the vitality of domestic consumption. We have improved the country's overall quality and promoted its economic development.

Keywords

Financial; Consumption Concept; Graduate Student; Consumption Expansion.

1. Introduction

1.1. Current Situation of Graduate Enrollment Expansion

Since the resumption of the graduate enrollment system in 1978, the enrollment of graduate students in China has been increasing, especially in the 20 years after the implementation of the university enrollment expansion policy in 1999, the number of graduate students in China has increased by 14 times. Now, according to the statistics of the Ministry of Education of China, the total number of graduate students in China has reached 10 million, and in 2022 alone, the number of graduate students in China reached 3.65 million, indicating that the number of graduate students in China has grown rapidly in the past decade."Since the 18th National Congress of the Communist Party of China, the Ministry of Education has implemented two rounds of comprehensive reforms, with 'moral education, service demand, improving quality and the pursuit of excellence', accelerated the building of a major country in graduate education, guaranteed the overall quality of graduate education, and steadily stride forward into a strong country in graduate education, and made historic achievements."Hong Dayong, director of the Department of Degree Management and Graduate Education, concluded at a press conference of the Ministry of Education held on June 14,2022[2]. From the National Bureau of Statistics, the change in the number of graduate students in the past decade, we can easily conclude that with the development of economy and technology, the demand for high-end talents is also increasing. At the same time, the country has also given strong policy support for the development of high-end talents. In his 20th CPC report, General Secretary Xi Jin ping stressed that the implementation of the new development concept is the only way for China to develop and grow in the new era. The new development concept is a systematic theoretical system, emphasizing that innovation is the primary driving force for economic development, and the essence of innovation-driven development is talent-driven, which reveals that China's

economic development in the new stage of development needs the accumulation and reserve of high-end talents[3]. As one of the representatives of the high-end talent market, graduate students are of great significance to accelerate the transformation of development power and ultimately promote the increase of economic aggregate, and their scale and quality have also attracted much attention. Looking forward to the future of graduate education, the pace of enrollment expansion will not stop, and a more diversified education system will surely be more complete. Released on December 19,2023, the Ministry of Education on deepening the academic degree and professional degree graduate education classification development opinion stressed, focusing on national strategy, key areas and the social demand, further enhance the proportion of professional degree graduate students, to the end of the "difference" master's degree graduate student enrollment scale expanded to about two-thirds of the total scale, greatly increase the number of doctoral degree graduate enrollment. It has pointed out the direction for the future development of graduate education in China and laid a solid foundation for the development of educational equity in China.

1.2. China's Consumption Status and Facing Problems

Since the reform and opening up, China's economy has developed rapidly, and the residents' income level has risen sharply. As a result, the consumption level of residents increases year by year, and the people's sense of happiness increases year by year. According to the National Bureau of Statistics released the data of household consumption level in the past decade, we can find that although it has maintained a certain growth. However, due to the impact of the epidemic, the increase of unemployment rate and other economic downward factors, the growth rate of China's economy has declined in the past three years, leading to a decline in the growth rate of household consumption level. Among them, the factors affecting residents dare not bold consumption are mainly divided into two points[4]. First of all, due to the epidemic, residents' consumption concept have changed or we can call it "consumption downgrade". People are reluctant to buy luxury products and fancy clothing and are more likely to prevent accidents that store money in the bank. Second, and most directly, due to the impact of the epidemic and the downturn in the financial market, people's income has declined and they lack confidence in the future consumption. All walks of life have been hit hard by the epidemic. The real estate industry is particularly serious, the price is plummeting, and most of the people's property is real estate, and most of them are loans to buy, the loan repayment pressure is greater. Assets shrank, and the economic decline. Consumer confidence will be hit, and the willingness to spend will then decline. Facing the opportunity of the development of science and technology education in China and the predicament of the consumption status quo. The research on the development of graduate education and the expansion of consumption is of great empirical significance to explain the correctness of national policies, the necessity of high-end education development in the future and the reality of positive consumption expectations in China in the future.

2. Organization of the Text

2.1. Theoretical Analysis of the Development of Graduate Education on Expanding Consumption

Theoretically, the development of graduate education is also helpful to the development of China's consumption level. First of all, I think graduate education can cultivate more high-level and professional talents for the society. With the progress and development of the society, the demand for talents from all walks of life is increasing, especially for some high-tech fields. Postgraduate education can cultivate more high-level talents and meet the social needs of all kinds of professionals. This will make the development of various industries in the society more prosperous and thus promote the development of the development force. The level of social

development power that we have learned in microeconomics determines the level of economic development of a society. When a society becomes rich and people's income is increased, consumption will be expanded and economic vitality will be improved under normal circumstances. Secondly, graduate students' scientific research achievements and innovation ability can bring more scientific and technological progress and economic development to the society. The scientific research work of graduate students often involves frontier fields and unsolved mysteries. Through their own research and innovation ability, they have brought to the society more scientific research results and innovation motivation. These achievements have not only promoted the progress of science and technology, but also injected new vitality into the economic development of the society. These vitality may lead to qualitative changes and thus promote great social progress. For example, the discovery and application of electricity in the second industrial revolution was also the result of the development of higher education abroad. Thus promoting the transformation of the society to the electrical society, the social consumption level is also to a higher level. Third, the graduate student itself is a kind of stimulus to the economic consumption. Personal income is low because in school, most of the spending still comes from their parents. Graduate student tuition fees, information fees, accommodation fees and even their own living expenses will stimulate the social consumption and improve the consumption level of residents. Fourth, I think the popularization of higher education will also change people's consumption habits. Through the influence of long-term diversified education, people gradually prefer to focus on the consumption of improving the quality of life, rather than only focusing on saving money[5]. People with highly educated consumers tend to be more rational and more willing to make some benign investments. The change of consumption concept has an important impact on both the graduate students themselves, their families and even the whole society.

2.2. Empirical Analysis on the Relationship between the Development of Graduate Education and the Expansion of Consumption

In this paper in the theory part of the qualitative analysis of the rapid development of graduate education in China may affect the overall consumption ability, but if you want to study the correlation between them, and test whether they have causal relationship and the direction of the relationship, need to use econometric test to accurately, this chapter by collecting relevant data of provinces and cities in China, create a panel data model for empirical analysis, quantitative research the influence of graduate education development on the overall scale of consumption.

3. Index Selection and Model Establishment

3.1. Selection of Indicators

3.1.1. Explained Variables and Interpret Variables

Table 1. Definition of the variables

type of variable	metric	variable name
explained variable	Total retail sales of social consumer goods	Consumer
explanatory variable	Number of graduate students in each province	Graduate
controlled variable	Residents' disposable income	Income
	Open to the outside world	Open
	Government intervention	Gov
	Technology innovation level	Tech
	Human capital level	Hum

Data source: China Statistical Yearbook.

3.1.2. Statistical Description of the Variables

Table 2. Statistical description of the variables

Variable	N	Mean	SD	Median	Min	Max	describe
Consumer	310	11362.80	9560.32	8800.25	322.20	44882.9	Total retail sales of social consumer goods
Graduate	310	83529.72	79678.21	61609.00	1244.00	4.71E+05	Number of graduate students in each province
Income	310	27246.17	12498.97	24562.50	9740.00	79610	Residents' disposable income
Hum	310	94.18	59.17	83.75	3.35	269.50	Human capital level
Tech	310	30663.46	51877.09	14127.50	9.00	3.65E+05	Technology innovation level
ln_Consumer	310	8.92	1.04	9.08	5.78	10.71	ln(Consumer)
ln_Graduate	310	10.84	1.16	11.03	7.13	13.06	ln(Graduate)
ln_Income	310	10.13	0.40	10.11	9.18	11.28	ln(Income)
ln_Hum	310	4.24	0.95	4.43	1.21	5.60	ln(Hum)
ln_Tech	310	9.26	1.74	9.56	2.20	12.81	ln(Tech)
Open	310	0.97	4.82	0.32	0.06	59.52	Open to the outside world
Gov	310	0.29	0.20	0.23	0.11	1.38	Government intervention

Results as shown in the table2, the data interval selected in this paper is the logistics industry development and macroeconomic indicators of 31 provinces and cities from 2013 to 2022, with a total of 310 observed values. Specific terms, through the analysis of the maximum and minimum sample data distribution, and the size of the standard deviation of human capital, technological innovation level, disposable income, the number of provincial graduate students and the total retail sales of social consumer goods data and the standard deviation is larger, the trend in the scope of the uncertainty is common, so the index logarithmic processing, after smooth data can alleviate the model may be autocorrelation and endogenous problems[6].

3.1.3. Collinearity Test of the Variables

In order to prevent the pseudo regression caused by the high collinearity among variables, the variance expansion factor test, or VIF test, and the results are shown in the table3:

Table 3. Variance inflation factor

Variable	VIF	1/VIF
ln_Hum	9.80	0.102041
ln_Tech	9.17	0.109051
ln_Graduate	6.48	0.154321
Gov	3.95	0.253165
ln_Income	3.72	0.268817
Open	1.10	0.909091
Mean VIF	5.70	

Variance inflation factor (Variance Inflation Factor, VIF): the reciprocal of the tolerance, the larger the VIF, the worse the collinearity. The empirical judgment method shows that there is no multicollinearity when $0 < VIF < 10$, when $10 < VIF < 100$, and when $VIF > 100$, with severe multicollinearity. The results of our test of the two models showed that the VIF variance expansion factor of the variables was less than 10, which basically shows that there is no multicollinearity, so we can continue the analysis of the model.

3.1.4. Correlation Analysis of the Variables

Table 4. Correlation coefficient matrix of the variables

	ln Con~r	ln Gra~e	ln Inc~e	ln Hum	ln Tech	Open	Gov
ln Consumer	1						
ln Graduate	0.854***	1					
ln Income	0.500***	0.624***	1				
ln Hum	0.919***	0.818***	0.276***	1			
ln Tech	0.927***	0.840***	0.575***	0.865***	1		
Open	-0.0830	-0.0690	0.117**	-0.0930	-0.0720	1	
Gov	-0.763***	-0.737***	-0.389***	-0.822***	-0.837***	-0.0110	1

The correlation coefficient matrix reported in the table4 shows that the correlation coefficient between the number of graduate students (ln Graduate) and total retail sales of consumer goods (ln Consumer) is significant at the level of 1 per cent, and the correlation coefficient is positive, indicating a positive correlation between the two of them. Among the control variables, the correlation coefficients between household disposable income (ln Income), human capital level (ln Hum) and technological innovation level (ln Tech) and total retail sales of consumer goods (ln Consumer) were all significant at the 1% level, indicating a correlation and positive correlation with the explained variables. The correlation coefficient between the degree of government intervention (Gov) and total retail sales of consumer goods (ln Consumer) was significant at the level of 1 per cent, indicating an correlation and negative correlation with the explained variables. It should be noted that the correlation coefficient can only explain the statistical correlation, but not the economic causality. The description of the causality needs our further modeling analysis.

3.2. Model Building

3.2.1. Model Setting

The basic model of this paper is set up as follows:

ε_{it} In the upper formula, The t indicates the year, I indicates that the selected provinces and cities, Y_{it} represents the value of the explained variables of the data in year t, The explained variables selected in this paper are the total retail sales of consumer goods in the region (ln Consumer), Represents the explanatory variables selected for this paper, The core explanatory variable was the number of graduate students in the region (ln Graduate), Control variables include level of technological innovation (ln _ tech), degree of government intervention (gov), level of human capital (ln _ hum), level of opening to the outside world (open) and resident disposable income (ln Income), For the intercept terms in the model, Represents the random error terms of the model, For the region-level virtual variables, To control for unobservable individual differences, λ_t is the dummy variable of the year, To control for unobservable differences in time. By establishing the linear model of the above formula, we can specifically study the specific effect of the selected explanatory variables on the consumption level in the region, and then we can establish the relevant model to estimate it.

3.2.2. Panel Model Screening

Since the problems analyzed in this paper include information on cross section and time series, it is a strictly balanced panel data model, and it should decide whether to choose the ordinary least squares, two-way fixed effect model or random effect model before formally entering the regression analysis. The first step requires an F test of the data, Judging whether it should be a mixed or fixed effects model, When the p-value was <0.05 , And reject the original hypothesis, Believe that there is an individual effect, Mixed regression models should not be used, A fixed-effects model should be preferred; the second step, Based on the above results, the use of LM test, Compare using a mixed regression model or a random effects model, If the null hypothesis is rejected, Mixed random models should not be used; The third step is the Hausman-test of the samples, Judge whether a fixed effect model or a random effect model, If the null hypothesis is rejected, a fixed-effects model is used, If the null hypothesis is accepted, a random effects model is used.

Table 5. Test results of the model screening

	fixed effect model or Mixed section model	random effect model or Mixed section model	fixed effect model or random effect model
result	F checkout	LM test (Likelihood ratio test)	Hausman-Test
test statistic	32.81	256.79	108.99
p price	0.000	0.000	0.000
model selection	fixed effect model	random effect model	fixed effect model

The test results are shown in the table5, The statistic of the F-test in step 1 is 32.81, A p-value equal to 0.000, Showed that the fixed-effects model outperformed the mixed-regression models, Note that a fixed-effects model should be used; The second-step LM test still rejected the null hypothesis, The tested statistic is equal to 256.79, A p-value equal to 0.000, Represents that the random effects model outperforms the mixed regression model, In the third step, the Hausman test statistic is 108.99, A p-value equal to 0.000, This indicates that the fixed effect model again outperforms the random effect model. Considering the above tests, the subsequent regression analysis will be based on the estimated results of the fixed effect model.

3.2.3. The Heterogeneity Analysis

We will sample the provinces and cities according to the is divided into three groups of economic zones, the eastern region, central region and western region, respectively using fixed effect model to see whether there are differences in the influence of income level, considering the possible differences in the model, at the same time using R OBUST robust standard error estimation, estimation results are shown in the table6:

Results estimated using the two-way fixed effects model are shown in the table above. After controlling the differences between unobservable individuals and years, the goodness of fit was improved, and the explanatory power of the model was improved, indicating that the fitting effect of the sample regression model is better, which indicates that the explanatory power of the sample regression model is high and the model design is reasonable.

Specific view: the core explanatory variables provincial graduate students in school (In Graduate) the coefficient estimates in the central and western regions under the five percent significance level of rejection coefficient is equal to zero, the provincial graduate students in the region of consumption level is significant, it also illustrates the robustness of the benchmark model results in this paper. However, in the eastern region model, the estimated coefficient

value of the number of graduate students (ln Graduate) in the explanatory variables did not pass the significance test of the variables, indicating that this influence does not exist in the eastern region, and the development of graduate education in the provinces increased the improvement of the consumption level in the central and western regions.

Table 6. Estimation results of the fixed-effect model

	EAST	MID	WEST
ln_Graduate	0.304	0.602**	0.412***
	(1.44)	(2.54)	(2.87)
ln_Income	4.030***	5.038***	2.648***
	(5.30)	(7.97)	(7.56)
ln_Hum	-0.430**	-0.326	0.475***
	(-2.33)	(-0.93)	(3.60)
ln_Tech	0.152*	0.071	-0.052
	(1.98)	(1.20)	(-0.86)
Open	0.000	0.059	0.025
	(0.18)	(0.49)	(0.67)
Gov	-0.149	0.160	-0.123
	(-0.24)	(0.22)	(-0.42)
cons	-34.435***	-45.420***	-14.547***
	(-5.22)	(-8.29)	(-4.26)
Individual effect	control	control	control
Year effect	control	control	control
N	110.000	80.000	120.000
r2_w	0.790	0.887	0.891
F	21.113	29.966	50.798

t statistics in parentheses: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

4. Summary and Conclusion

4.1. Summary:

1) The development and promotion of graduate education plays a positive role in promoting the expansion of social consumption in China. The Chinese government expands the enrollment of graduate students. The policy of valuing higher education is entirely right. It has played a positive role in promoting the recovery of China's economic vitality in the post-epidemic era, the development of higher education and the improvement of the overall comprehensive quality of the society.

2) Through the analysis of the heterogeneity of the development of graduate education and the expansion of consumption in various provinces, the development of higher education in the past ten years also has different effects on different regions of China. According to the analysis of the results, although graduate education plays a positive role in the expansion of consumption in all provinces in China, the increase of consumption level in the central region and the western region is more significant than that in the eastern region. According analyzing the reasons, the first point is that the economic education in the eastern region is relatively

developed and the higher education has been in a relatively advanced state. In the past 10 years, although graduate education has developed rapidly in the eastern region, the infrastructure in the region has been relatively complete and the consumption concept has been relatively enlightened. Therefore, the development of graduate education has a weak influence on the region. For the central region and the western region economic education development is relatively backward, in nearly ten years after graduate education get rapid development in the region infrastructure development, social comprehensive cultural quality, people's income is also has the qualitative improvement, finally lead to consumption concept more enlightened. Therefore, the faster growth rate of the consumption level in this region is deeply affected by the development of graduate education. This study also further shows that the development of graduate education has played a positive role in the goal of common prosperity in China, and has practical significance for promoting social harmony and progress and educational equity.

4.2. Conclusion:

- 1) The country should continue to adhere to the goal of rejuvenating the country through science and education, develop a series of higher education such as graduate education, and further promote the popularization of doctoral education. But for the expansion of graduate students if moderate, there is a clear plan rather than blind chaos. To avoid the situation of talent surplus, we should allocate a reasonable talent structure. It is a long-term way to promote the development of education and inject new vitality into social and economic development and consumption expansion.
- 2) The country should not only pay attention to the development of graduate education, but also to ensure the quality of graduate students. As an important source of human capital accumulation in China, graduate students are the basic resource for China to promote industrial transformation and upgrading and promote economic development from high-speed development to high-quality development. It is necessary to standardize the graduate enrollment assessment and graduation related procedures and actively develop basic education in China to lay a solid foundation for education. The improvement of the quality of graduate students has injected new vitality into China's economic development and made the cake of the Chinese economy bigger. Thus promote the expansion of China's consumption, and break China's current consumption dilemma.
- 3) At the same time, the development of graduate education should also pay attention to the balance between regions, and give policies to central and western China where education is underdeveloped, and provide more educational funds and resources. The development of graduate education can also react on the local economic development to drive the progress of the overall level of the region. According to the above empirical analysis, the impact of the development of graduate education in the areas with underdeveloped economic development on the expansion of local consumption is greater than the expansion of local consumption in the development of graduate education in the economically developed areas. In other words, increasing investment in education in economically underdeveloped areas is more cost-effective. While making the cake of China's economy bigger, we should also divide it evenly. According to the knowledge of microeconomics, only promoting the fair development of social economy can promote the improvement of social production efficiency. People's income has increased, and only good expectations for the future can promote the expansion of social consumption.

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