

The Stimulating Effect of Consumption Voucher on China's Tourism Industry after the Epidemic

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Abstract: The era occupied by the COVID-19 is coming to an end, but the loss it has brought to the world is immeasurable. Tourism, as a key industry or even a pillar industry in many countries, how to revive tourism as soon as possible has become a major concern of all countries in the post-epidemic era. This paper studied the status quo of tourism industry in 20 Chinese cities after the epidemic, divided them into groups by whether to issue consumption vouchers or not, and studied the factors which can influence tourism income increment. The study found that the policy of coupon distribution did not play an important role in promoting tourism. Meanwhile, the local GDP and education level also played a positive role in the recovery of tourism. This study is able to provide some reference value for the government and tourism departments in formulating policies to promote consumption in this industry.

Keywords: consumption voucher, tourism industry, differential method

1. Introduction

Since the COVID-19 broke out globally in 2020, countless industries have suffered severe economic shocks, and tourism has been one of the hardest hit industries in the economic crisis. After the global spread of COVID-19, demand for travel has apparently disappeared. In 2020, the number of international tourists fell by 74%, export earnings fell by \$1.3 trillion, and 100 to 120 million tourism jobs were at risk [1]. The COVID-19 outbreak has caused significant tourism-related job losses. OECD (2020) estimates that between 6.6 and 11.7 million tourism workers across Europe are at risk [2]. John Connell represented by three island nations: Fiji, Vanuatu and Samoa, the collapse of tourism led to increased unemployment and the closure of hotel and tourism industries, which had a multiplier effect throughout the island economy [3]. Thus, recent empirical studies confirm that tourism-dependent countries have larger and more active responses to the adverse effects of COVID-19 than countries with low tourism-dependent responses [4].

For China, the impact of the epidemic on tourism is incalculable. According to the data from CARNOC.com Civil Aviation Resource Net of China (n.d.), Beijing, Shanghai and Guangzhou airports serve as hubs for China's three major airlines, namely Air China, China Eastern Airlines and China Southern Airlines [5]. These airports are also the gateways to international air travel in China and have been hardest hit. The negative impact of COVID-19 on tourism was transmitted to transportation, entertainment, shopping and other related sectors. [6]. Therefore, tourism consumption voucher came into being. In response to the impact of the novel coronavirus epidemic

on China's economy, issuing consumer coupons has become a policy choice for local governments to boost consumption and stabilize economic operation.

This paper is mainly divided into the following parts. First, it analyzes the tourism industry under the epidemic situation from a global perspective, and then it takes a general view of how the governments of various countries stimulate domestic demand and consumption to maintain the development of tourism. Second, the paper studies the impact of consumer vouchers by comparing the economic increment of cities that issue consumer vouchers and those that do not by using differential model (DID). Finally, by introducing psychological theory into the discussion, the policy effect of the distribution of consumer coupons after the epidemic in China is roughly evaluated.

2. Literature Review

2.1. Tourism from the Perspective of Epidemic

This is not the first time that global tourism has been affected by a pandemic. Pine, McKercher and Chon studied the impact of the 2002 SARS epidemic on Hongkong, China, showing that the effect is negative, substantial and significant [7]. Movement restrictions, border closures, cancellations of flights and other means of transport and shuttered tourist destinations have shattered assumptions about travel and tourism before the pandemic [8]. Since tourism is essentially mobile and travelling, global restrictions on travel have had a huge impact on the industry. According to Gössling et al.'s research, ninety per cent of the world's population lives in countries with some degree of restriction on international travel, and many of these countries also have some degree of restriction on internal movement [9].

2.2. The Influencing Factors of the Utility of Consumption Voucher

Li divided the factors influencing consumers' behavior of using coupons into three dimensions - the consumption coupon itself, the consumer dimension and the merchant dimension [10]. Ding divided Weibo users' emotional tendency towards the consumption coupon policy into external attribution and internal attribution, and classifies each part in more detail [11]. Volgger et al. found that the presence of international tourists and the rapid rise in COVID-19 cases have reduced the willingness of domestic tourists to book trips [12].

2.3. Research Gap

In the context of global pandemics, this paper studies the stimulating effect of consumption vouchers. In general, the study of tourism consumption voucher is at its beginning stage. Most of them focus on the description of the phenomenon of the issuance of consumption vouchers in a certain area, and lack of research on the effect factors of policy implementation. Therefore, on the basis of a comprehensive analysis of the effect of the issuance of tourism consumption vouchers, this paper conducted a preliminary study on its influencing factors, hoping to have a positive reference significance for the government and relevant departments to formulate policies.

3. Framework and Research Design

The research design and DID analytical framework are shown in Figure 1.

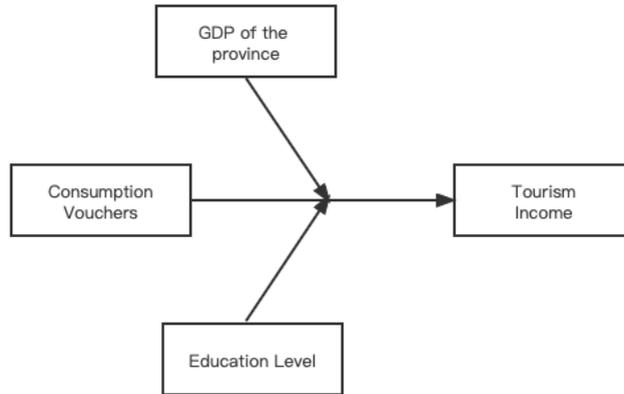


Figure 1: Framework of the experiment.

3.1. Subsidy Policy Practice and Main Experience

3.1.1. Consumption Coupons—Taking Tourism as Example

External means such as developing new products and promotion cannot really stimulate tourism demand. By issuing tourism consumption vouchers, the tourism cost of tourists decreases, offsets the negative impact of declining disposable income on tourism demand, and can really bring tourism consumption. The issuance form of tourism consumption coupons can be measured from three aspects: issuing subject, issuing object and issuing channel. There are three categories based on the subject of issuance: direct issuance by the government, corporate issuance and joint issuance by the government and enterprises. Distribution channels are diverse, including but not limited to on-site, travel agencies, Internet, etc. [13].

3.1.2. The Influence of Consumer Coupons on China's Economy

Luo and Wang demonstrated that the issuance of consumer vouchers helps to promote economic growth, increase social consumption and increase employment levels, while also contributing to increases in interest rates, price levels and the real exchange rate. It also finds a negative correlation between consumer vouchers and investment and export growth [14]. Lin compared the consumption situation of 36 cities that issue coupons and others that do not issue coupons, and found that the number of transactions and transaction amount of related industries in cities that issue coupons are significantly higher than those that do not issue coupons [15].

3.2. Experimental Design and Framework

DID is a measurement which can be used to investigate the relative difference between the specific behaviors of the control group and the treatment group before and after the occurrence of policies, that is, the net effect of policies.

Since the research focus of this paper is the increment of tourism income caused by consumption vouchers, and income level and education level only serve as intermediary variables in the experiment, this experiment will study the relationship between y and x , z m and n respectively, and finally integrate into a linear relationship.

The final model:

$$y_i = \alpha x_i + \beta z_i + \gamma m_i \quad (1)$$

3.2.1. Variable Selection

3.2.1.1 Dependent Variable

Referring to many previous studies on tourism, this paper divides tourism consumption into expenditure and income. Considering that there are many expenditure destinations and statistics are not easy, this paper selects tourism income as the reference index of local tourism consumption. In addition, since the situation of tourism before and after the epidemic is very different, this paper only selects the period of the outbreak (2020) and the period of initial control of the epidemic (2021) for research.

3.2.1.2 Independent Variable.

The core explanatory variable of this paper is the amount of consumption coupons issued, namely x_i represents different cities, namely the amount of tourism vouchers issued in each city.

The mediating variables used in the testing mechanism are per capita income, education level and GDP of the province that this city belongs to. Due to the instability of per capita income in the context of the epidemic, this paper selected the per capita wage level in the middle of the study period (December 2020) as the reference data, representing the local income level. Educational attainment is represented by the number of local higher education schools.

3.2.1.3 Data Sources and Descriptive Statistics

The time dimension selected in this paper is 2020-2021. Tourism income, per capita income, education level come from CEIC DATA database, the GDP of each province is from CEInet Statistics Database. The amount of consumption coupons issued is counted through the news of different regions, and descriptive statistics of related variables can be seen in Table 1.

Table 1: Descriptive analysis.

Item	Sample	Min	Max	Mean	Std. Dev.	Median
City	20	0.00	1.00	0.50	0.51	0.50
Tourism Income (2020)/million	20	60070.00	252629.00	132378.97	53608.85	116333.50
Tourism income (2021)/million	20	50165.00	302100.00	153116.26	67481.65	131638.50
Difference	20	-17935.00	49471.00	20737.28	19558.88	23682.50
Amount of vouchers /10 thousand	20	0.00	8000.00	1298.00	2196.81	50.00
Education level /number of high education institution	20	6.00	83.00	39.85	21.34	47.00
GDP of the province / hundred million	20	120000.00	530000.00	347500.00	101144.76	345000.00

4. Results and Data Analysis

4.1. Basic Hypothesis Test

The hypothesis of parallel trend should be satisfied before the use of the method of double difference. In order to use t test, the explained variable must obey normal distribution. Therefore, before t test, normality test should first be carried out.

Since the distribution of consumption coupons was only carried out in some cities, and the distribution of consumption coupons in the control group was all 0, it was a normal phenomenon that the amount of consumption coupons did not show a normal distribution. Therefore, it can be concluded that the explained variables in this paper meet the characteristics of normal distribution, the parallel trend test can be conducted by t-test.

Before the distribution of consumption vouchers, there was no remarkable difference in tourism income between the experimental group and the control group. This means that there is no significant difference in tourism revenue between the cities that issued tourism vouchers and other prefecture-level cities before the policy was implemented. At the same time, due to the lag property of tourism consumption voucher, it is normal that tourism income does not increase significantly in the short term. Therefore, it can be seen that the experimental group and the control group conform to the "parallel trend hypothesis" before the implementation of the tourism consumption voucher policy.

4.2. Analysis of Benchmark Results

Twenty cities in China were selected for this experiment and divided into two groups. Ten cities in each group had pre-pandemic travel conditions similar to those in the other group. The description data is provided in Table 2.

Table 2: DID model description statistics.

	Before	After	Total
Control	10	10	20
Treated	10	10	20
Total	20	20	40

4.2.1. Tourism Income and Consumption Vouchers Issued

Through the test of DID model, it has not been found that the policy of issuing consumption coupons can fully contribute to the increase of tourism income, but it has a positive impact. The results of this experiment are shown in Table 3.

Table 3: DID model results summary.

Time	Items	Effect value Tourism income	Standard error	<i>t</i>	<i>p</i>
Before	Control	116211.65			
	Treated	149739.66			
	Diff(T – C)	33528.01	30852.42	1.09	0.29

Table 3: (continued).

After	Control	123467.91			
	Treated	183957.95			
	Diff(T – C)	60490.03	30852.42	1.96	0.06*
8*Diff-in-Diff		26962.03	36769.61	0.73	0.47

Note: R2: 0.19. Adjust R2: 0.09. * $p < 0.1$ ** $p < 0.05$ *** $p < 0.01$.

Although the analysis chart of DID not show that the distribution of consumption coupons has a direct impact on the increase of tourism income, it can be seen from the t test of post-test data that the post-test results show strong significance (see Table 4). Therefore, it can be explained that consumption coupons have a positive impact on tourism income, and the increase in tourism revenue is not solely dependent on the number of vouchers distributed.

Table 4: t-test after experiment.

Items	Control $n=10$	Treated $n=10$	Diff	t	p
Tourism income	123467.91	182764.60	59296.69	2.14	0.05**
Number of vouchers	0.00	1976.00	1976.00	3.83	0.00***

Note: * $p < 0.1$ ** $p < 0.05$ *** $p < 0.01$.

The principle of DID model was to use OLS regression for effect size test, and the value of the interaction term between treated and time was the Diff-in-Diff differential effect value of the study. As can be seen from Table 5, p value is close to 0.1, which also indicates that the policy of distributing consumption coupons in the study has an impact on the increase of tourism income.

Table 5: OLS regression analysis results (n=40).

	Regression coefficient	Standard error	t	p	95% CI	R2	Adjust R2	F
Constant	116211.65	18384.80	6.32	0.00	78888.51 ~ 153534.79	0.19	0.09	$F(4, 35) = 2.01$ $p = 0.12$
Vouchers	-0.60	8.41	-0.07	0.94	-17.67 ~ 16.46			
Treated	33528.01	30852.42	1.09	0.29	-29105.73 ~ 96161.74			
Time	7256.26	26000.04	0.28	0.78	-45526.62 ~ 60039.15			
Treated * Time	26962.03	36769.61	0.73	0.47	-47684.25 ~ 101608.30			

Note: Tourism income is the explained variable. * $p < 0.1$ ** $p < 0.05$ *** $p < 0.01$.

4.2.2. Tourism Income and GDP of the Province

The relationship between tourism income and GDP is a field that scholars pay extensive attention. Therefore, the study of this paper also considers the GDP of each region. In this paper, the GDP of the corresponding provinces in each region in 2021 is selected as a reference, and the relationship between GDP and tourism revenue increment is analyzed through the model. The experimental results are shown in Table 6.

Table 6: DID model results summary.

Time	Items	Effect value Tourism income	Standard error	<i>t</i>	<i>p</i>
Before	Control	64256.81			
	Treated	98210.45			
	Diff (T-C)	33953.65	25082.09	1.35	0.19
After	Control	71513.07			
	Treated	132428.75			
	Diff (T-C)	60915.68	25082.09	2.43	0.02*
Diff-in-Diff		26962.03	35443.77	0.76	0.45

Note: R^2 : 0.24. Adjust R^2 : 0.16. * $p < 0.1$ ** $p < 0.05$ *** $p < 0.01$.

Before the experiment, the Diff effect value was 33953.65 but did not show significant effect ($p < 0.05$), which means GDP has no effect on tourism income. After the experiment, the Diff effect value was 60915.68 and presented a 5% level of significance, meaning that the experimental group effect value was significantly higher than the control group effect value.

According to the OLS regression results of this experiment in Table 7, the interaction between treated and time was significant ($p < 0.05$), that is, GDP plays a positive role in the increase of tourism income.

Table 7: OLS regression analysis results (n =40).

	Regression coefficient	Standard error	<i>t</i>	<i>p</i>	95% CI	R^2	Adjust R^2	<i>F</i>
Constant	64256.81	36385.52	1.77	0.09	-9609.72 ~ 138123.33	0.24	0.16	$F(4, 35) = 2.83, p = 0.04^{**}$
GDP of the province	0.15	0.09	1.64	0.11	-0.04 ~ 0.33			
Treated	33953.65	25082.09	1.35	0.19	-16965.70 ~ 84872.99			
Time	7256.26	25062.53	0.29	0.77	-43623.38 ~ 58135.91			
Treated * Time	26962.03	35443.77	0.76	0.45	-44992.65 ~ 98916.71			

Note: Tourism income is the explained variable. * $p < 0.1$ ** $p < 0.05$ *** $p < 0.01$.

4.2.3. Tourism Income and Education Level

Tourism income and education level are rarely paid attention to, but this paper chooses to focus on the relationship between the two. The reason is that during the epidemic, most universities in China

are closed, and after the epidemic is released, college students may become the main consumer group in the tourism market. Therefore, this paper chooses education level as a factor affecting tourism income and analyzes it.

Through analysis, as shown in Table 8, p value was significantly less than 0.05 after the policy was introduced, which proves that education level has a positive impact on the increase of tourism income. However, since the final p value is not less than 0.05, it can be concluded that education level cannot directly determine the increase of tourism income.

Table 8: DID model results summary.

Time	Items	Effect value Tourism income	Standard error	<i>t</i>	<i>p</i>
Before	Control	66984.74			
	Treated	87255.34			
	Diff(T-C)	20270.60	22485.05	0.90	0.37
After	Control	74241.00			
	Treated	121473.63			
	Diff(T-C)	47232.63	22485.05	2.10	0.04**
Diff-in-Diff		26962.03	31441.17	0.86	0.40

Note: R2: 0.41. Adjust R2: 0.33. * $p < 0.1$ ** $p < 0.05$ *** $p < 0.01$.

The value of the interaction term treated and time was the Diff-in-Diff effect value of the study. It could be seen from the Table 9 that the interaction term presented a significant and extremely significant value. Therefore, it can be concluded that education level has a positive impact on tourism income to a large extent.

Table 9: OLS regression analysis results (n =40).

	Regression coefficient	Standard error	<i>t</i>	<i>p</i>	95% CI	R2	Adjust R2	<i>F</i>
Constant	66984.74	20864.97	3.21	0.00	24626.59 ~ 109342.89	0.41	0.34	$F(4, 35) = 5.96, p = 0.00***$
Education level	1386.67	386.45	3.59	0.00	602.14 ~ 2171.21			
Treated	20270.60	22485.05	0.90	0.37	-25376.48 ~ 65917.67			
Time	7256.26	22232.26	0.33	0.75	-37877.63 ~ 52390.16			
Treated * Time	26962.03	31441.17	0.86	0.40	-36866.94 ~ 90791.00			

Note: Tourism income is the explained variable. * $p < 0.1$ ** $p < 0.05$ *** $p < 0.01$.

4.3. Results and Discussion

The three experiments examined the impact of coupon distribution, local GDP and local education level on the recovery of tourism after the pandemic. It is not difficult to see that education level is the most influential factor. After DID experiment, the results showed a significance of 0.04, and OLS regression showed a significance of 0.001. Second, GDP, DID experiment results showed 0.02 significance, OLS regression showed 0.04 significance. Finally, the distribution of consumption coupons. Although OLS regression results showed that this policy had a positive impact on the increase of tourism income, DID model did not respond to this.

The results of the experiment were actually different from the expected results. Before the experiment, framework predicted that consumption coupons would become a direct factor affecting the recovery of tourism, but the experiment found that consumption coupons were not the main reason. In addition, since the final p values of the three experiments did not show significance, it can be concluded that these three factors are only three of the factors affecting the tourism, but they are far more than three factors that can influence the recovery of tourism. Due to the small number of factors studied in this paper, DID model did not respond to these three factors.

Anticipatory regret is an important internal factor that affects consumption. Due to the fear of the epidemic, or worried about the negative events people may face after traveling, the expected regret will occur, leading to hesitation and hesitation before consumption. Therefore, the consumption coupons are distributed but not canceled. Risk perception theory also has a crucial impact on the utility of tourism vouchers. These two concepts are also often used to explain why people behave irrationally in behavioral economics.

5. Conclusion

This paper firstly analyzes the current situation of the global tourism industry under the epidemic situation and the measures taken by various countries to encourage the revitalization of the tourism industry, including subsidies and issuing consumer coupons, which are issued in various forms and through various channels. Then, in order to study the reasons that really stimulate the increase of tourism income, three variables are designed to study their impact on tourism income respectively. The results show that these three factors, the number of vouchers issued, the GDP of each province and the local education level, all have a positive impact on the growth of tourism income, but to different degrees. In addition, none of them can directly affect the increase of tourism income, so it can be concluded that there are still many factors affecting tourism income that have not been studied in this paper.

Although the relationship between the three variables and the increment of tourism income is roughly proved through experiments, the research in this paper has many shortcomings. First, the use of data. Due to time, there have no time to make questionnaires, issue questionnaires, and carry out effective questionnaire recycling and analysis. Instead, the study directly cited data released by various major databases and local statistics bureau as the experimental basis, which made the results not targeted. In the later part of the introduction of psychological theory, more in-depth research and analysis could not be made using the survey results of the questionnaire. Second, the research process lacks rigor. This study did not set control variables to obtain more accurate data, but studied and explained the relationship between the three variables and dependent variables through a simple linear equation. In the next study, more variables and control variables should be added to enhance the accuracy of experimental results.

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