

An Empirical Study on Factors Influencing the Competitiveness of Service Industry in Guangxi

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Abstract: This paper chooses the level of economic development, income level, demographic factor, urbanization level, industrialization level, openness, government function, human resources as the affecting factors which influence the competitiveness of Guangxi service industry by taking full account of the previous research experience and the actual situation of the development of service industry. This paper selects a total of 13 years' data in the range of 2000 to 2012 and uses cointegration analysis and error correction model to analyze the short-term and long-term relationships between dependent and independent variables. Then finding out the main factors that influence the competitiveness of service industry, respectively are the per capita GDP, urbanization level, openness and government function.

1. Introduction

In the 21st century, great changes have taken place in China's service industry. As one of the three industries, the service industry's status is rising in the national economy. The service industry has gradually become an important driving force for economic development. Under the general trend of the world economy which changes from the industrial economy to the service economy, the development of China's service industry is being taken more seriously. Guangxi service industry has made great progress in this trend. "Statistical Communique of 2013 national economic and social development of the Guangxi Zhuang Autonomous Region" statistics that in 2013 the tertiary industry as a service industry added value is 517.139 billion yuan, indicating an increase of 10.2 percent; the region's annual GDP is 1.4378 trillion yuan and the tertiary industry added value accounts for 36 percent in the region's annual GDP. All listed data shows that the service industry in Guangxi is growing, the level and competitiveness enhance unceasingly, which has become one of the important areas of the region's economic development. However, the overall competitiveness of the service industry is weak than other parts of our country. There exist some problems, such as low-level services, backward technology, low efficiency etc. Therefore, this paper is in order to explore the reason of these problems and find out the various influencing factors of the competitiveness of service industry based on the previous literature.

2. Variable Selection and Model Building

2.1 Variable Selection

This paper summarizes others' research and actual situation of economy and takes the data availability into account to decide to adopt one dependent variable and eight independent variables in order to study the level of service development.

2.1.1 Dependent Variable

The development level of service industry. The service industry added value can embody the regional service industry development best. So using the proportion of service added value accounted for the GDP to explain the development level because of units. This dependent variable is shown in SGDPR.

2.1.2 Independent Variable

Level of economic development. In this paper, it can be measured in per capita GDP and expressed as PGDP^[1].

Income level. In this paper, it can be measured in per capita annual disposable income of urban households and expressed as PADI.

Demographic factor. In this paper, it can be measured in population density and expressed as PD^[2].

Urbanization level. In this paper, it can be measured in non-agriculture ratio and expressed as NAR.

Industrialization level. In this paper, it can be measured in the proportion of industry added value accounted for the GDP and expressed as IGDPR.

Openness. In this paper, it can be measured in total import & export ratio and expressed as TIER.

Government function. In this paper, it can be measured in the proportion of service investment in fixed assets accounted for total investment in fixed assets and expressed as PIFA.

Human resources. In this paper, it can be measured in the number of college students per million and expressed as HR.

2.2 Model Building

According to the above variables and multiple linear regression models, this paper quantitative analyzes the development level of the service industry in Guangxi. Construct the model as follows:

$$SGDPR_t = \beta_0 + \beta_1 PGDP_t + \beta_2 PADI_t + \beta_3 PD_t + \beta_4 NAR_t + \beta_5 IGDPR_t + \beta_6 TIER_t + \beta_7 PIFA_t + \beta_8 HR_t + \varepsilon_t$$

Among them: β_0 is the constant term, $\beta_1, \beta_2 \dots \beta_8$ are coefficients, ε is error term.

3. Empirical Analysis of Influencing Factors

3.1 Data Source

Because there is a big gap in indicators and range before and after the year 2000 statistics, so this paper collects thirteen years' data from 2000 to 2012 in Guangxi for authenticity and comprehensiveness. All data are from the "Guangxi Statistical Yearbook"(2001-2013). Most of the indicators are calculated by using formula with the data from yearbooks. Since the total import & export that are from the statistical yearbook and their units are dollars, so we change dollar into yuan with the middle price of exchange rate of RMB per year. It is convenient for further calculation.

3.2 Unit Root Test

If the time series are not stable and don't have unchanged center trend, so it can occur deviation when we conduct regression and produce significant and well-fitted spurious regression^[3]. Therefore, this paper conducts unit root test on all variables before doing regression. The most common method is ADF unit root test. We should map each variable sequence first before we conduct unit root test and observe whether there is the intercept and trend or not, then choose one method according to these images. The test results are shown in table 1.

Table 1. The Result of Unit Root Test

variables	Differen tial times	ADF values	10% level	5% level	1%level	conclusion
SGDPR	0	-4.07213	-2.71375	-3.14492	-4.12199	steady
PGDP	2	-3.80667	-2.80138	-3.32096	-4.58264	steady
PADI	2	-2.78857	-2.74767	-3.21269	-4.29707	steady
PD	1	-6.97645	-3.46079	-4.00815	-5.29538	steady
NAR	1	-3.15713	-2.74767	-3.21269	-4.29707	steady
IGDPR	1	-3.51605	-2.77112	-3.25980	-4.42059	steady
TIER	1	-3.93896	-2.74767	-3.21269	-4.29707	steady
PIFA	1	-4.66086	-2.72898	-3.17535	-4.20005	steady
HR	1	-4.97227	-2.77112	-3.25980	-4.42059	steady

Table 1 clearly shows that most variables pass the stationary test at 1% level and others pass the test at 5% level. So the data are stationary in the differential form and there doesn't exist spurious regression. Differential times in the table are known as orders. The order of dependent variable SGDPR is zero and less than all independent variables' orders, so we can carry on cointegration analysis.

3.3 Cointegration Analysis (EG two-step method)

In order to test whether there exists cointegration relationship between the different variables and examine how these variables impact service industry in the economic fundamentals, so this paper uses EG two-step method.

3.3.1 Cointegration Regression Estimating

Table 2. The Result of Cointegration Regression

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.043499	0.568951	1.834072	0.140561
PGDP	0.181122	0.115278	1.571172	0.191237
PADI	0.000007	0.000014	0.477975	0.657616
PD	-0.005263	0.003413	-1.541905	0.197956
NAR	0.848402	1.004895	0.844269	0.446054
R-squared	0.775480	Mean dependent var		0.372477
Adjusted R-squared	0.326440	S.D. dependent var		0.023206
F-statistic	1.726975	Durbin-Watson stat		2.239398
Prob(F-statistic)	0.313568			

From table 2 we can see that R-squared of cointegration model is 0.78 and it shows a high-fitted degree of this equation. Durbin-Watson stat is 2.24, which indicates that the model does not has autocorrelation. Therefore, the long-term equilibrium relationship among variables is:

$$SGDPR_t = 1.043499 + 0.181122 PGDP_t + 0.000007 PADI_t - 0.005263 PD_t + 0.848402 NAR_t - 0.372937 IGDPR_t + 1.476538 TIER_t + 0.692578 PIFA_t + 0.000892 HR_t$$

3.3.2 Unit Root Test of the Residual Sequence E

Get residuals of regression equation above. Then we use ADF unit root test to test this residual sequence in order to see if the residual sequence is stable. Result of residual sequence unit root test is shown in Table 3. From the table we can see that the unit root test statistic is -4.279319, which is significantly less than 1% level's critical value(-4.200055). Therefore, we should reject the null

hypothesis at the 1% significant level and the residual sequence E has no unit root. It indicates that there exists a cointegration and long-term equilibrium relationship among the above variables.

Table 3. The Result of Residual Sequence Unit Root Test

Null Hypothesis: E has a unit root			
Exogenous: Constant			
Lag Length: 1 (Automatic based on SIC, MAXLAG=2)			
		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.279319	0.008857
Test critical values:	1% level	-4.200055	
	5% level	-3.175352	
	10% level	-2.728985	

4. Analysis of Empirical Results

The proportion of service added value accounted for the GDP increases one percentage point can make per capita GDP increase 0.18 percentage points. Income level's coefficient is very small because this data is very large. Urbanization level has an obvious influence on service industry and the regression coefficient is 0.85, which indicates that urbanization can effectively promote the development of service industry. In this paper, we find that the development of industry and service industry is negative correlated through empirical analysis. Openness has an obvious influence on service industry and the regression coefficient is up to 1.48, which indicates that openness plays a significant positive impact on the development of service industry. Government function's regression coefficient is 0.69, which shows that government plays an important role in the development of service industry. Effect of human resources on the service industry is not obvious, but it has a positive promoting effect.

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