Econometric Analysis on Development of Construction Industry in Zhanjiang

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Abstract—In order to discuss influence factors for the development of Zhanjiang construction industry, this essay adopts the regression analysis method to conduct an empirical analysis to the construction industry data of Zhanjiang City during 2003-2013. The result indicates that main factors affecting the construction industry gross output in Zhanjiang include local housing construction area, local consumer price and local average annual pay. Therefore, the gross output of construction industry in Zhanjiang can be affected by regulating the above-mentioned three factors.

Keywords—Construction Industry, Least Square Method, Econometrics, Zhanjiang

I. INTRODUCTION

Housing markets play a crucial role in economies and the collapse of a real-estate bubble usually destabilizes the financial system and causes economic recessions.

The construction industry is the important material production department in national economy which has a close relationship with the overall national economic development and improvement of people’s livelihood. The construction industry has a high industrial relevancy and large capacity of employment. In recent years, the construction industry has developed quickly along with the economic growth of Zhanjiang City, gradually occupied an important position in the economy of Zhanjiang city, and become one of pillar industries of Zhanjiang City.

According to the statistics, 2011-2013, the construction industry of Zhanjiang City had developed rapidly, completed separately 20,436 million Yuan, 24,748 million Yuan, 33,294 million Yuan, and realized a year-on-year growth of 21.8%, 21.1% and 34.5%. Since 2014, the construction industry of Zhanjiang City has entered the regulation period with a relatively slow growth speed. In 2015, 10 enterprises surveyed realized 450 million Yuan of operating profit, with a year-on-year growth of 51.7%, while the growing rate decreases 13.5% on a year-on-year basis.

II. MODEL SETTING AND DATA DESCRIPTION

Ten years of local construction industry data during 2003-2013 is selected from the website of Zhanjiang Municipal Statistics Bureau to analyze the influence of all factors to the construction industry gross output.

<table>
<thead>
<tr>
<th>Year</th>
<th>construction industry gross output (10000 Yuan) Y</th>
<th>gross domestic product(10,000 Yuan) X2</th>
<th>housing construction area (square meters) X3</th>
<th>permanent resident population (10,000 people) X4</th>
<th>consumer price index X5</th>
<th>average annual pay (Yuan/Person) X6</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>616552</td>
<td>4839463</td>
<td>494388</td>
<td>645.19</td>
<td>100.0</td>
<td>11918</td>
</tr>
<tr>
<td>2004</td>
<td>6514785</td>
<td>5517005</td>
<td>5156087</td>
<td>660.66</td>
<td>103.8</td>
<td>13532</td>
</tr>
<tr>
<td>2005</td>
<td>759650</td>
<td>6809679</td>
<td>669400</td>
<td>668.95</td>
<td>101.4</td>
<td>15076</td>
</tr>
<tr>
<td>2006</td>
<td>892768</td>
<td>8055223</td>
<td>696113</td>
<td>685.64</td>
<td>101.7</td>
<td>16990</td>
</tr>
<tr>
<td>2007</td>
<td>1092127</td>
<td>9244084</td>
<td>831350</td>
<td>688.48</td>
<td>103.2</td>
<td>19886</td>
</tr>
<tr>
<td>2008</td>
<td>12329444</td>
<td>10994066</td>
<td>970697</td>
<td>691.12</td>
<td>106.2</td>
<td>21809</td>
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<tr>
<td>2009</td>
<td>14657751</td>
<td>11566678</td>
<td>17241594</td>
<td>693.44</td>
<td>99.4</td>
<td>23944</td>
</tr>
<tr>
<td>2010</td>
<td>16773905</td>
<td>14050630</td>
<td>19436628</td>
<td>700.38</td>
<td>103.0</td>
<td>26787</td>
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<tr>
<td>2011</td>
<td>20436278</td>
<td>17002272</td>
<td>24279424</td>
<td>706.92</td>
<td>105.1</td>
<td>29280</td>
</tr>
<tr>
<td>2012</td>
<td>24748133</td>
<td>18602206</td>
<td>29710124</td>
<td>710.92</td>
<td>103.2</td>
<td>33965</td>
</tr>
<tr>
<td>2013</td>
<td>33294280</td>
<td>20600069</td>
<td>31872752</td>
<td>716.71</td>
<td>102.1</td>
<td>40534</td>
</tr>
</tbody>
</table>

Data Sources: Zhanjiang Bureau of Statistics
\( Y \) represents the construction industry gross output of Zhanjiang (10,000 Yuan), \( X_2 \) represents the gross domestic product of Zhanjiang (10,000 Yuan), \( X_3 \) represents the housing construction area of Zhanjiang (square meters), \( X_4 \) represents the permanent resident population of Zhanjiang (10,000 people), \( X_5 \) represents the consumer price index of Zhanjiang, \( X_6 \) represents the average annual pay of Zhanjiang (Yuan/Person). The data is shown in Table I.

The design model is as following:

\[
Y_t = \beta_0 + \beta_2 X_{2t} + \beta_3 X_{3t} + \beta_4 X_{4t} + \beta_5 X_{5t} + \beta_6 X_{6t} + \mu_t
\]

The least square regression is carried out with Eviews analysis software, and the regression result is shown in Figure 1.

![Figure 1 Regression Analysis Result](image)

### III. MODEL PARAMETER ESTIMATE AND TEST

The following equation is obtained via the parameter estimate.

\[
\hat{Y}_t = -40994456 - 2.446778 X_{2t} + 0.831075 X_{3t} - 60656.85 X_{4t} + 722010.3 X_{5t} + 1659.56 X_{6t}
\]

According to the economic significance test, \( X_{2t} \) and \( X_{4t} \) are negative which do not conform to economic common sense that they are deleted.

The regression is carried out again, and the result is shown in Figure 2.

The regression equation is as follows:

\[
\hat{Y}_t = -24409618 + 0.713331 X_{3t} + 209787.3 X_{5t} + 251.1667 X_{6t}
\]
IV. RESULT

The results can be got in the following by the regression equation.

(1) The housing construction area of Zhanjiang has a significant influence to its construction industry gross output. Provided that other conditions are invariant, 1 square meter of housing construction area more, the construction industry gross output increases 7133.3 Yuan correspondingly.

(2) The consumer price index of Zhanjiang has a significant influence to its construction industry gross output. Provided that other conditions are invariant, every 1 consumer price index higher, the construction industry gross output increases 2097.873 million Yuan correspondingly.

(3) The annual average wage of Zhanjiang has a significant influence to its construction industry gross output. Provided that other conditions are invariant, every 1 annual average wage increase, the construction industry gross output increases 2.511667 million Yuan correspondingly.

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