Study on the Influence of Value-added Tax on the Project Cost of Prefabricated Buildings

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Abstract. It has become the inevitable choice through promoting the development of the prefabricated construction industry to achieve the construction industry transformation and to promote environmental protection. Moreover, the construction industry of China is going into the deductible chain and the construction will be changed with the format implementation of “replace business tax with value-added tax (VAT)” The characteristics of the factory production and the cost change induced by VAT are different from those of the cast-in-situ buildings. Based on the cost change of some real case, the paper analyzes the effect of the VAT, and finally puts forward the measures and methods to reduce the overall cost from the enterprise and the industry level.

1. Introduction

Prefabricated buildings construction is produced from extensive, labor-intensive to intensive fundamental change. It can be used to achieve savings of resources through improving the construction quality and efficiency. Moreover, it has become the inevitable trend for the construction industry to achieve the transformation and construction of sustainable development. Compared with the traditional cast-in-situ buildings, prefabricated buildings related to buildings constructed with pre-assembly method. That is, prefabricated components are manufactured in the factory, transported to the site, and then assembled together. In recent years, China has also introduced a large number of policies and measures to actively promote the development of prefabricated buildings. But at present, Chinese prefabricated building development is still in its infancy, costs of prefabricated buildings are higher than the cast-in-situ buildings. With the implementation of Chinese VAT, the construction cost calculation has also been changed. The purpose of the VAT is that the overall tax burden does not increase or decrease slightly. However, the tax change in the situation is a big controversy in academic area hereinafter referred to as VAT. At the same time, due to the changes in the production prefabricated construction mode, there is a big difference between the project costs with the traditional cast-in-situ construction methods after the implementation of VAT. In the context of the country’s vigorous implementation of the development of the prefabricated buildings, it urgently needs to clarify the impact of the VAT on the cost of the prefabricated buildings. It also needs to promote the development of prefabricated building proposals from the perspective of industry and enterprises.

2. Literature Review

2.1 Differences between business tax and value-added tax

The VAT involves business tax and value-added tax respectively. There are many differences between these two taxes around the tax scope, tax rate design, tax calculation and other aspects. Business tax is a kind of price tax, the payment of which is borne by the seller and the taxable amount is calculated based on the turnover including the tax payable. Value-added tax is a kind of
tax to be borne by the consumer and levied on the value added in the process of producing or selling goods or services, which also include the general tax method and the simple tax calculation method [1].

It does not need to deduct, and it is easy to be calculated for business tax. Moreover, not influenced by the purchase of goods or value-added tax services, the tax payable about the turnover tax rate is “fixed value”. However, the value-added tax method is relatively complex, the need for input tax deduction and tax payable relative to the sales tax rate is “variable value”, not only influenced by the output tax related, but also influenced by the purchase of goods or accept value and the related services to achieve the impact of input tax. It is same for the simplify value-added tax calculation method and business tax calculation method; the only difference is its calculation is based on the same non-tax sales rather than tax-inclusive turnover.

Table 1. The comparison between business tax and value-added tax.

<table>
<thead>
<tr>
<th>Taxes</th>
<th>Calculation Formula</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business tax</td>
<td>Tax payable = business tax × tax rate</td>
<td>Business tax includes tax payable</td>
</tr>
<tr>
<td>General taxation method</td>
<td>Tax payable = output tax - input tax</td>
<td>Sales do not include sales tax</td>
</tr>
<tr>
<td>Simple taxation method</td>
<td>output tax = sales × tax rate</td>
<td>Sales do not include sales tax</td>
</tr>
<tr>
<td></td>
<td>Tax payable = sales × collection rate</td>
<td></td>
</tr>
</tbody>
</table>

2.2 Development of prefabricated buildings and their characteristics

On September 27th, 2016, the General Office of the State Council issued the “Guidance on the Development of Prefabricated Buildings”, and the guidance propose that China will strive to use 10 years or so, that is, by 2025, the prefabricated buildings will occupy the 30% of new construction area. However, according to authoritative data, it is shown that at the end of 2015, the prefabricated buildings only occupy about 5% of new construction areas [2]. The compound growth rate of Chinese prefabricated buildings is about 25%; there is great potential for its development. However, there is a high initial cost in the development of Chinese prefabricated building, which lack of economies of scale and other obstacles [3]. It has become the main factor to affect the change of the business participation and consumer market demand.

Compared with the cast-in-site buildings, the costs of prefabricated buildings are mainly reflected in the construction and installation costs. At present, it has been well studied around the artificial, material consumption, mechanical use and the sub-project analysis of prefabricated building changes costs [4-5], that constitute the direct costs of construction. The composition of construction costs includes material costs, labor costs, construction equipment use fees, business management fees, profits, fees and taxes, and less from the perspective of tax construction costs of changes. On one hand, it has been applied for value-added tax in some construction industry-related upstream industries [6], such as building materials, engineering equipment sales, construction machinery and equipment sales, which was repaired before the implement of the VAT in the construction industry. Three percent of the total tax rate, which has been applied for business tax in the construction industry, does not belong to complete chain of deduction. Its turnover tax also repeated tax situation and pushed up the cost of prefabricated building projects finally.

On the other hand, compared with traditional cast-in-situ buildings, there are several differences in component production, transportation and construction of prefabricated buildings [7]. Therefore, the costs of prefabricated buildings and traditional cast-in-situ buildings are different. Although some scholars have analyzed the impact of the VAT in the cost of common construction projects, there exist few studies on the construction of the prefabricated buildings. For example, according to the Business Tax Reform Value-added Tax Pilot Scheme published by China’s Finance Ministry in 2011 [8], the rate of construction industry is “11%”, but value-added tax rate of component factory is still 17%. There is 6% in the tax burden during these two aspects which brings a great deal of
uncertainty in the impact of the project cost. The state has not been targeted for assembly-related value-added tax adjustment requirements for the assembly of buildings in the current construction industry. The relevant value-added tax rate induced by the VAT is still not adaptable.

2.3 The effect of the VAT on prefabricated buildings

With the application of the VAT in the construction industry and the emerging of the value-added tax in deduction chain, the repeated taxation will be eliminated. The core feature of value-added tax is the deductive mechanism and its deductible characteristic, the tax deduction and certificate deduction rate. However, many building materials and labors are lack of certificate deductions, it will make to increase the tax input deduction difficulty and increase costs [9].

The prefabricated buildings have the characteristics of design standardization, production factory, construction assembly, which will make the construction market gradually standardized and make a complement in the standardized development of the construction industry after the implement of VAT. The core feature of VAT is to open up the deduction chain, interlocking, layers of offset, deductible chain integrity. As a price tax, value-added tax does not only have its own impact on the entire industry chain on the construction enterprises, but also has an impact upstream and downstream. But the current prefabricated market is not yet mature. There are still some items which could not offset. Prefabricated building costs changes after the implementation of VAT are still unknown. It will become extremely critical to analyze the reasons for this phenomenon.

Prefabricated building costs will be changed to the consumer goods and make an effect on the prefabricated building market demand. Therefore, to promote the development of prefabricated building process, it does not only need the government incentives, but also need to reduce the cost to stimulate market effectiveness. Moreover, based on the existing research, this paper analyzes the impact of VAT on the cost of the prefabricated buildings. The paper also proposed the measures to reduce the overall cost from the enterprise and the industry level based on the study of the engineering price rules and the actual project cost.

3. Analysis of Engineering Pricing Rules

3.1 Change of engineering costs rules after VAT

According to the Construction and Installation of the Cost of the Project Composition, published by China’s Ministry of Housing and Urban-Rural Development and China’s Ministry of Finance in 2013, the construction of the provisions for the construction and installation costs include the labor fees, materials fees, construction equipment fees, enterprise management fees, fees (these five elements above are called pre-profits and taxes expenses), profits and taxes (the taxes include business tax and additional tax calculated based on the business tax)[10]. According to analysis by Qian (2013) [7], construction and installation cost rules can be expressed as:

\[
\text{Project cost} = \text{pre-profits expenses} + \text{profit} + \text{payable tax} = (\text{pre-profits expenses} + \text{input tax}) + \text{profit} + \text{payable tax} + \text{additional tax} \tag{1}
\]

The payable tax is set as the “fixed value” under business tax and the business tax rate of construction industry is 3%. Therefore, the payable tax can be expressed as:

\[
\text{Payable Tax} = \frac{\text{project cost of pre-tax} \times \text{business tax rate}}{(1- \text{business tax rate})} \tag{2}
\]

Based on the Notice of the Full Opening of the Business Tax Levy Value-added Tax Pilot, published by China’s State Administration of Taxation and China’s Ministry of Finance in 2016, the value-added rate of construction industry is 11%. According to the construction of the standard by China’s Ministry of Housing and Urban-Rural Development and China’s Ministry of Finance in 2016, the project cost is expressed as:

\[
\text{Project cost} = \text{pre-tax project cost} \times (1 + 11\%). \tag{3}
\]

Combined with the analysis by Qian (2013) [7], value-added tax under the construction and installation project cost rules can be expressed as:

\[
\text{Project cost} = \text{pre-profits expenses} + \text{input tax} + \text{profits} + \text{payable tax} + \text{additional taxes and fees} \tag{4}
\]
\[= \text{pre-profits expenses} + \text{profits} + (\text{input tax} + \text{payable tax}) + \text{additional taxes and fees} = \text{pre-profits expenses} + \text{profits} + \text{output tax} + \text{additional taxes and fees} \quad (4)\]

The pre-profits expenses are divided into five parts: labor fees, material fees, construction equipment fees, enterprise management fees and fees. Therefore, the project cost can be expressed as:

Project cost = labor cost (tax-exclusive) + material fee (tax-exclusive) + construction equipment fee (tax-exclusive) + enterprise management fee (tax-exclusive) + fee (tax-exclusive) + profits + output tax + additional taxes and fees \quad (5)

The payable tax of project cost is changed to output tax according Eq.4. The output tax is expressed as:

\[\text{Output tax} = \text{sales amount} \times \text{tax rate} \quad (6)\]

Therefore, the tax is changed to “a fixed value” from “a change value”.

The five items in Eq.5, including labor fees, material fees, construction equipment fees, enterprise management fees and fees are calculated by the tax-exclusive law that input tax that free from deductible input tax. Therefore, the output tax is expressed as:

\[\text{The output tax} = \text{pre-tax costs} \times \text{additional tax rate} \quad (7)\]

According to the tax law in China, the additional tax in the Eq.5 is calculated based on the payable tax, which depends on the amount of value-added tax deductible certificate which is closely related to the level of enterprise management. Moreover, the additional tax accounted into current profit or loss makes an effect on the business operating profit. Therefore, the additional tax may be included in the pre-tax cost of enterprise management fees from the perspective of the composition of the project cost.

### 3.2 The main tax rate that constitutes the entry business of the project cost

1. Labor fees. From the point view of convenient deduction, the VAT rate of labor service company is 3% in construction service and 6% in labor service according to the difference between the income from the acquisition of construction services and the payment of wages as well as the social insurance [11].

2. Material fees. The materials in the prefabricated building are divided into four parts: components, steels (excluding the steels including in components), commercial concrete (excluding the concrete including in components) and other materials. The main applicable tax rate for the entry business is 17% for components and steels; 6% for commercial concrete; other materials have different rates, 17% or 3% on a pro rata basis.

3. Other deductible tax rate. The input tax rate for purchasing or leasing of machinery and equipment and temporary facilities is 17%; 11% for leasing machinery and operation staff simultaneously; 6% for the test fees; 11% for the professional subcontracting and labor subcontracting; and 3% for small-scale subcontracting.

### 4. Case Study About the Effect of VAT on the Cost of Prefabricated Buildings

#### 4.1 Sample buildings

Three residential buildings with the similar quantities in a same project were selected to analyze the effect of VAT on the cost of prefabricated buildings, and prefabricated rate is the measurable indicator. Wherein Building I is absolutely cast in site; building II uses prefabricated floors and stairs where the prefabricated rate is about 10%; Building III use prefabricated panels, floors, balconies and staircases, where the prefabricated rate is about 48%. The cost of the construction only includes the installation phase. The specific data are shown in Table 2, and the comparisons about project cost and taxes under VAT are shown in Table 3.

From the data in Table 2, the total project cost of building I increased ¥128,000, accounting for 9.20% of project cost under the business tax. The total project cost of building II increased ¥20700, accounting for 1.44% of project cost under the business tax. The total project cost of building III increased ¥495,600, accounting for 2.89% of project cost under the business tax.
From Table 3, business tax and project cost changes in the same direction whenever under VAT or not, but the value-added tax does not have this trend. Compared with the buildings II and III, with the increase of the prefabrication rate, the value-added tax and the input tax amount also increased. The value-added tax is only ¥96,000 when the prefabricated rate reaching 48%.

The purpose of this paper is to analyze the impact of VAT on the cost of prefabricated building. The selection cases include cast-in-situ buildings and prefabricated buildings. The calculation rules are including two ways: business tax and value-added tax. The changes of the project cost and the influence of VAT will be analyzed on the cost of the prefabricated buildings.

Table 2. Comparison between business tax and value-added tax about the three buildings (¥: ten thousands Yuan).

<table>
<thead>
<tr>
<th>Serial number</th>
<th>project</th>
<th>Value-added tax rate</th>
<th>Building I (cast-in-site)</th>
<th>Building II (prefabricated rate is 10%)</th>
<th>Building III (prefabricated rate is 48%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>One (I)</td>
<td>Direct fees</td>
<td>/</td>
<td>1073.92</td>
<td>1120.29</td>
<td>1149.31</td>
</tr>
<tr>
<td>(II)</td>
<td>Labor fees</td>
<td>0.03</td>
<td>367.07</td>
<td>353.24</td>
<td>353.24</td>
</tr>
<tr>
<td></td>
<td>Material fees</td>
<td>/</td>
<td>483.67</td>
<td>542.6</td>
<td>919.06</td>
</tr>
<tr>
<td>1</td>
<td>Where: component Steels (excluding the steels including in components)</td>
<td>0.17</td>
<td>/</td>
<td>96.33</td>
<td>642.57</td>
</tr>
<tr>
<td>2</td>
<td>Pipe pile</td>
<td>0.17</td>
<td>140.31</td>
<td>126.93</td>
<td>63.18</td>
</tr>
<tr>
<td>3</td>
<td>Brick and cement Commodity concrete (excluding the concrete including in components), mortar</td>
<td>0.17</td>
<td>31.26</td>
<td>23.54</td>
<td>24.59</td>
</tr>
<tr>
<td>4</td>
<td>Other direct costs Among them: temporary facilities, working materials and so on</td>
<td>0.17</td>
<td>221.92</td>
<td>214.17</td>
<td>91.91</td>
</tr>
<tr>
<td>5</td>
<td>Inspection and test fees</td>
<td>/</td>
<td>31.26</td>
<td>26.96</td>
<td>54.81</td>
</tr>
<tr>
<td>6</td>
<td>Shipping fees</td>
<td>/</td>
<td>26.75</td>
<td>30.06</td>
<td>43.25</td>
</tr>
<tr>
<td>(III)</td>
<td>Professional subcontracting</td>
<td>0.17</td>
<td>26.75</td>
<td>30.06</td>
<td>43.25</td>
</tr>
<tr>
<td>(IV)</td>
<td>Other direct costs</td>
<td>/</td>
<td>114.86</td>
<td>114.86</td>
<td>114.86</td>
</tr>
<tr>
<td>(V)</td>
<td>Enterprise management fees</td>
<td>/</td>
<td>81.57</td>
<td>79.53</td>
<td>65.9</td>
</tr>
<tr>
<td>1</td>
<td>Which: part of the office costs</td>
<td>/</td>
<td>78.2</td>
<td>76.2</td>
<td>61.9</td>
</tr>
<tr>
<td>2</td>
<td>Water and electricity</td>
<td>/</td>
<td>216.89</td>
<td>216.51</td>
<td>89.13</td>
</tr>
<tr>
<td>Three (VI)</td>
<td>Fees</td>
<td>0.13</td>
<td>9.06</td>
<td>9.06</td>
<td>9.06</td>
</tr>
<tr>
<td>Four (VII)</td>
<td>Profits</td>
<td>/</td>
<td>4.94</td>
<td>4.94</td>
<td>4.94</td>
</tr>
<tr>
<td>Five (VIII)</td>
<td>Pre-tax cost</td>
<td>/</td>
<td>1349.45</td>
<td>1397.75</td>
<td>1665.2</td>
</tr>
<tr>
<td>Six (IX)</td>
<td>Tax (business tax / sales tax)</td>
<td>/</td>
<td>41.7</td>
<td>43.19</td>
<td>51.45</td>
</tr>
<tr>
<td>Seven (X)</td>
<td>project costs</td>
<td>/</td>
<td>1391.15</td>
<td>1440.94</td>
<td>1716.65</td>
</tr>
</tbody>
</table>

Note: 1. The fees were calculated inconsistent based on the sales tax and value-added tax to ensure the level of corporate profits remain unchanged. The profits were taken directly under the sales tax to 5% fee is calculated by multiplying the base. 2. According to the “industrial building evaluation standards”
(GB/T51129-2015), the prefabricated rate is defined as the industrial building outside the floor and above the main structure as well as the prefabricated part of the concrete structure which in the corresponding components for the total volume of concrete volume ratio.

<table>
<thead>
<tr>
<th>Engineering name</th>
<th>Project cost (ten thousand Yuan)</th>
<th>Tax business tax (ten thousand Yuan)</th>
<th>Value-added tax (ten thousand Yuan)</th>
<th>Increase or decrease the tax (ten thousand Yuan)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Building I</td>
<td>1391.15</td>
<td>1403.95</td>
<td>41.7</td>
<td>139.13</td>
</tr>
<tr>
<td>Building II</td>
<td>1440.94</td>
<td>1443.01</td>
<td>43.19</td>
<td>143</td>
</tr>
<tr>
<td>Building III</td>
<td>1716.65</td>
<td>1667.09</td>
<td>51.45</td>
<td>165.21</td>
</tr>
</tbody>
</table>

4.2 Comparison of the comprehensive tax rate of cast-in-situ buildings and prefabricated buildings under VAT

Due to the differences of construction methods and prefabrication rate, the project costs of Building I, Building II and Building III is different. The comparison of comprehensive tax rate of the three buildings is show in Fig.1.

The payable tax in Building I is ¥45,000, the comprehensive tax rate is 3.88%; the payable tax in Building II is ¥498,500, the comprehensive tax rate is 3.45%; the payable tax in Building III is ¥96000, the comprehensive tax rate is 0.58%. Through the case analysis, with the increase of the prefabrication rate, the comprehensive tax rate of prefabricated buildings will be reduced, and the effect of VAT on the investment of cast-in-situ buildings and prefabricated buildings could not be neglected.

The reason for this phenomenon is that the cast-in-situ buildings are different from the prefabricated buildings. On one hand, the cast-in-situ construction method is to build steel, concrete and gravel and other raw materials directly into the buildings in the field. The assembly is made up of prefabricated parts in the construction site, and the production of the components is mostly done at the factory. The input tax rate of building materials is 17%, and the input tax rate of commercial concrete is 6%. The assembly structure reduces the consumption of building materials using component procurement. The overall input tax rate of prefabricated components is 17%. As the proportion of prefabricated components increases, the input tax on the project will also be increased. From the case of the three buildings of the input tax, it is not difficult to see that the input tax of Building I is ¥846,300; that of Building II is ¥931,500 and that of Building III is ¥1,556,100.

On the other hand, there are some differences in the way of lifting, installing and fixing the components in the construction site. The number of workers is reduced and the labor cost is also reduced accordingly. At present, the construction fee is only 3% of the input tax rate, compared with the traditional cast-in-situ construction method. Under the prefabricated construction method, this part of the labor costs are included in the project cost due to the workers transferred to the factory for component production, but the components of the entry tax rate are about 17%, compared with
the cast-in-site construction method of input tax. At the same time, with the transformation of
migrant workers to skilled workers, specialized labor enterprises would be gradually established.
After that, the prefabricated building labor costs will be further reduced.

4.3 The influence of VAT on the cost of prefabricated construction

Based on the study of the taxation of building II and the Buildings III, the overall sales tax was
not increased significantly with the increasing of the prefabrication rate, but the input tax has
increased with the prefabricated rate substantially. According to the case study, the prefabricated
rate is about 10%, of which the input tax can be deducted 65.14% of the output tax. The
pre-processing rate of about 48% of the put tax about the third floor can be offset 94.19% of the
output tax. With the increase of prefabricated components, the deductible input tax also increased,
and the actual taxable amount of the project will be further reduced. The taxable amount of
buildings II and III is ¥ 545,000 and ¥ 96000, respectively. The comparison of value-added tax for
different buildings is shown in Fig.2.

From the perspective of the cost of the prefabricated buildings, with the increase of the
prefabrication rate, the difference between the value-added tax and the business cost under the
business tax is gradually narrowing. According to the case analysis, the value of the project under
the value-added tax is only increased ¥20700 under the business tax. The cost of the project under
the value-added tax is less than ¥495,600. Although the project cost is lower than the project cost
under the business tax method, and the prefabrication rate in the actual project is mostly higher than
10% due to the project case is an experimental building. From the practical considerations of the
project, this paper argues that when the project prefabrication rate reaches a certain degree, VAT
will reduce the cost of prefabricated building.

Considering the extreme situation, with the project prefabricated rate’s rising, the input tax will
exceed the output tax, and the projected tax payable will also be negative. This phenomenon will
result in enterprises’ “sales tax and input tax upside down” risks and increase the enterprise “long
stay”, which means increasing the cost of the project. With the rapid development of China’s
prefabricated buildings, sales and input tax upside down the risk will gradually expand. But at
present China has not introduced on the prefabricated building value-added tax rate adjustment,
prefabricated factories still use 17% under value-added Tax rate. Some experts believe that
prefabricated components of the production chain should be defined as the construction process,
and value-added tax should take 11%. Therefore, the study in the next section will benefit from the
perspective of the participants in the assembly structure analysis value-added tax rate design issues.

4.4 Design of value-added tax rate for prefabricated buildings

The core feature of value-added tax is the deductive mechanism, and VAT on the construction
industry is the key to the value-added tax rate design [12]. Therefore, to achieve the expected
structural tax reduction function, VAT in the tax rate design is most important. With the rapid
development of prefabricated buildings, prefabrication rate will be gradually increased. There is an
urgent need for China’s prefabricated building aspects of the value-added tax rate.

At present, there is one of the areas in increasing controversy is the component production and
construction links. On one hand, most of the production and construction enterprises of the prefabricated building components are independent so that the component manufacturers will bear 17% of the value-added tax output tax, and construction enterprises in the procurement of components will receive 17% of the entry tax rate. Through the deduction it can be reduced for overall tax burden of construction enterprises, but it also increased the burden of component manufacturers. Although the value-added tax is the price of foreign taxes, component manufacturers can be 17% of the value-added tax by the price transferred to the purchaser, but the current scale of the fabricated construction market has not yet appeared, component manufacturers will be borne a certain increase in costs. This means that most of the 17% value-added tax rate will be borne by the component manufacturers, not only increase the overall tax burden, but also will seriously hinder the development of China’s prefabricated buildings.

On the other hand, through the previous analysis, it can be seen that with the increasing of the prefabrication rate, the 17% for the input value-added tax rate and the 11% for the project sales tax rate may cause the risk of the tax upside down. It can also be induced the increasing of the project cost. Moreover, the tax burden will also be increased and the component production should not be equivalent to the general production of building materials, its essence is the site construction links to the factory, to ensure the quality of production, reduce on-site construction pollution, and resource conservation. If it is still in accordance with the value-added tax 17%, not only will improve the component manufacturing enterprises and construction enterprises, but also will increase the cost of prefabricated building projects. Therefore, this paper suggests that relevant institutions in China should analyze the relevant value-added tax rates for prefabricated buildings and redefine the tax rates. At the same time, this paper proposes to adjust the value-added tax rate of the component production as soon as possible from the original 17% to 11%. Through this, it can firstly reduce the burden of component manufacturers, and secondly, it can be canceled as the 6% difference tax rate, from the tax level to the prefabricated building to increase the threshold to achieve the goal of promoting the development of prefabricated buildings.

5. Conclusions

Through the above analysis, this paper believes that VAT will be a certain extent and to reduce the cost of prefabricated buildings, which can be used to promote the development of prefabricated buildings. Although the current prefabricated buildings lacks of scale and other issues, the project cost is still higher than the cast-in-situ buildings. But with the implementation of VAT and assembly of building development, the industrial chain will increase the integration of industrial benefits to playing, and then open up the upstream and downstream enterprises deductible chain, reducing the cost of prefabricated buildings. At the same time, prefabricated buildings with the design standardization, production and construction mechanization and other characteristics will further improve the building supply market and personnel, improve the ability to obtain entry vouchers, thereby reducing corporate tax burden. Therefore, there exists a complementary relationship between the construction industry for VAT and the development of prefabricated buildings. Through breaking the chain to reduce the duplication of the development of prefabricated building will also promote VAT in the implementation in return.

At the same time, in the process of analyzing the influence of the project on the construction cost of the prefabricated buildings, it is found that the relevant tax rate of the construction industry is not considering the actual construction, and there are risks such as tax inversion. This paper argues that the value-added tax rate is one of the main factors affecting the project cost. On this basis, it is suggested that the value-added tax rate of the production part of the assembled building components can be adjusted from 17% to 11%. The adjustment of tax rate will involve different relevant parties of prefabricated buildings. This paper is based on the analysis of project cost, and does not analyze the tax rate adjustment in order to avoid the problem of logical confusion and lack of clarity. But the analysis of the adjustment of the value-added tax rate of the prefabricated buildings is necessary and will serve as the focus in the future research.
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References


[2] Information on http://www.gov.cn/zhengce/content/2016-09/30/content_5114118.htm


