



Research on the Influence of VAT Reform and Application of Information Technology

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Abstract. Manufacturing industry is the foundation of China's economic development and an important part of the real economy. In the VAT reform, the manufacturing industry has been the biggest and most obvious beneficiary of tax reduction. This paper discusses the impact of the new VAT policy on the manufacturing tax burden and the application of information technology in the VAT reform by taking the reduction of the VAT rate in 2019 as the entry point. The main content of this paper includes four parts. First, introducing the 2019 VAT New Deal and its impact on China's manufacturing industry; the second is the theoretical analysis of the effect of manufacturing value-added tax rate reduction; the third is the manufacturing VAT rate reduction effect data analysis. Additionally, the paper summarizes the full text, and puts forward some policy opinions and suggestions to promote the transformation and upgrading of the manufacturing industry in view of the impact of the reduction of VAT rate on the manufacturing industry. By analyzing the macro data of the Bureau of Statistics, this study found that the decrease of the effective VAT rate significantly promoted the improvement of enterprise profitability and output efficiency. At the same time, the reduction of value-added tax on the rise of enterprise costs to restrains the obvious effect. This paper also puts forward suggestions on the blind expansion of manufacturing enterprises and the unfair tax burden. Finally, this paper introduces and analyzes the mode of using information technology to optimize the VAT collection and management system, which plays a certain role in improving the information transparency between tax authorities and all parties and perfecting the invoice management system, and provides references for solving the problem of VAT loss in China.

Keywords: Value-added Tax · Tax Rate · Manufacturing Industry · Information Technology

1 Introduction

Value added tax is a kind of turnover tax that is levied on the basis of tax plan as the value-added forehead generated in the process of commodity circulation.

In order to implement the decisions and arrangements of the CPC Central Committee and The State Council and promote substantial VAT tax reduction, VAT will be adjusted on a large scale in 2019. We will significantly lower the VAT rate levied on manufacturing and other public service industries from 16% to 13%, and reduce the VAT rate levied on public service industries such as public transportation and construction from 10% to 9%.

Since the implementation of replacing business tax with VAT in 2016, the scope of VAT collection has been greatly expanded, covering manufacturing, commerce and all service industries. As the main source of fiscal revenue, the loss of VAT will have a great impact on China's fiscal revenue. The loss of VAT is largely due to the defects of VAT collection and management system. At present, China mainly adopts the punishment after the event to curb the loss of VAT. If we can prevent the loss of VAT by optimizing the collection system, it will effectively improve the loss of value-added tax.

Since the official implementation of relevant policies of tax reduction and fee reduction in 2016, the Chinese government has made a preliminary analysis on the effect of the implementation of tax reduction and fee reduction policies while making further efforts to implement them. The results show that tax and fee cuts have substantially stimulated economic development and made outstanding contributions to the sustainable and vigorous development of economy. China's VAT reform has a profound impact on China's enterprises. The purpose of reducing the VAT rate is to give enterprises and industries more preferential treatment and convenience. This paper tries to analyze the impact of VAT rate reduction on manufacturing industry by combining qualitative and quantitative analysis and actual data, and tries to put forward policy suggestions.

In 2018 and 2019, the two new VAT policies will give enterprises and industries more preferential treatment and convenience on the original basis. In the face of VAT rate reduction and related tax and fee reduction, enterprises must carry out necessary financial reform and operation adjustment on the basis of practical analysis of relevant impacts if they want to obtain real benefits. Previous studies have made a preliminary study on the impact of tax reduction on enterprises and manufacturing industry. Researchers studied the actual impact of VAT rate reduction on enterprises, including tax reduction and burden reduction, cost reduction, efficiency improvement, market expansion and market share increase. This is conducive to the operation and development of small and micro businesses [1]. After the reduction of the VAT rate, the seller should transfer part of the price to the other party after negotiation, so that both parties can share the tax reduction dividend [7]. Researcher proposed through actual model analysis and research that after tax rate reduction, enterprises can reduce the VAT tax payable by 0.58 yuan per 100 yuan of tax-inclusive sales [6]. Previous studies have also explored the macro-level impact of tax cuts on the market and the country. The reduction of VAT rate is conducive to directly reducing the burden of tax on enterprises [2]. This will help adjust the industrial structure of enterprises, boost domestic demand and expand the market [3]. Scholars believes that the impact of VAT rate reduction on the manufacturing industry is mainly in four aspects: promoting fixed asset investment, improving the efficiency of resource allocation, enhancing the competitiveness of China's manufacturing industry in international trade, and benefiting the fairness of negative tax [5].

2 Materials and Methods

2.1 Case Analysis

The cost of manufacturing tax has always accounted for a large proportion of the total VAT cost of Chinese enterprises. Analysis of the data shows that the average annual VAT burden of Chinese enterprises is around 15%. According to the World Tax Report 2019, the actual cost of the input tax burden on Chinese enterprises accounts for about 65% of their VAT profits. The substantial reduction of VAT input tax rate will further reduce the input tax burden of manufacturing-related enterprises. Take the dramatic reduction in China’s corporate VAT input rate from 16% to 13%. When the pre-tax preferential price remains unchanged, which means the seller completely distributes the preferential input tax to the buyer through price adjustment.

In order to comprehensively evaluate the impact of VAT rate reduction on income distribution in China, this study introduced VAT input tax deduction mechanism [4].

$$\sum_{i=1}^n P_i Q_i + V_j + VAT_j = P_j Q_j \tag{1}$$

P is price, Q is quantity; i and j are different industries. Therefore, VAT output tax is expressed as $\frac{P_j Q_j}{1+T} T$, VAT input tax is expressed as $\sum_{i=1}^n \frac{P_i Q_i}{1+T} T + \frac{T}{1+T} K$. K represents the cost of fixed assets. VAT payable is:

$$VAT = \frac{P_j Q_j}{1+T} T - \sum_{i=1}^n \frac{P_i Q_i}{1+T} T - \frac{T}{1+T} K \tag{2}$$

Suppose an enterprise obtains sales profit of X million yuan, cost of Y million yuan, and input tax deducted from other related expenses is Z million yuan. Assuming that 16% tax rate is applied, VAT payable by the manufacturing enterprise is

$$0.16 * (X - Y) - Z \tag{3}$$

when 13% tax rate is applied, VAT payable of the enterprise is

$$0.13 * (X - Y) - Z \tag{4}$$

After VAT rate adjustment, the tax burden of enterprises is

$$\frac{[0.16 * (X - Y) - Z] - [0.13 * (X - Y) - Z]}{[0.16 * (X - Y) - Z] * 100\%} \tag{5}$$

When z is zero, the VAT tax burden drops by 18.75%. When all other assumptions are equal, the after-tax price is constant. The VAT rate changed from 16% to 13%, and the original VAT payable is

$$X * 16/116\% - Y * 16/116\% - Z \tag{6}$$

When the 13% tax rate is applied, the VAT payable is

$$X * 13\%/113\% - Y * 13\%/113\% - Z \tag{7}$$

VAT rates after adjusting the enterprise tax burden reduce

$$\frac{[(X * 16\% * 16\%/116\%/116\% - Y - Z) - (X * 13\% * 13\%/113\%/113\% - Y - Z)]}{(x * 16\% * 16\%/116\%/116\% - y - z) * 100\%}. \quad (8)$$

When z is 0, the VAT tax burden decreases by 16.63%. This study cites two special cases in which the VAT rate was reduced from 16% to 13%. In reality, such extreme situations are less likely to occur. Buyers and sellers will decide the distribution of tax incentives through market game and negotiation.

2.2 Theoretical Analysis

Enterprises may face a variety of situations and choices when they are faced with the problem of how to distribute tax incentives. The price of goods, services or raw materials purchased by enterprises may be lower because of the reduction of VAT rate, or the price may not be changed. The above analysis of the two extreme cases shows that no matter how tax benefits are distributed among enterprises, the reduction of VAT rate will reduce the tax burden of enterprises.

The rate of reduction of corporate tax burden is not directly reflected in the increase of corporate profits. In order to analyze the influence of tax reduction on enterprises, the bargaining power of VAT between enterprises and upstream material manufacturers should be considered comprehensively. Firstly, the influence of bargaining power is mainly reflected in whether the supply price of raw materials by upstream suppliers can decrease with the decrease of VAT. The tax benefits of enterprises with poor bargaining power may be taken up by other enterprises. Secondly, in the market of consumer products, the bargaining power of enterprises is related to the elasticity of consumer demand. If the elasticity of consumer demand is large, tax incentives are taken by consumers through price changes. Therefore, for enterprises with weak competitiveness or small scale in the industrial market, the reduction of VAT rate may reduce their sales revenue and affect their profits.

The decrease of the VAT rate of small and medium-sized enterprises increases the marginal economic income of enterprises. This allows companies to have more cash flow to invest on a large scale, and boosting productivity. At the same time, for some large enterprises, enterprises are likely to invest more money in the research and development of the next generation of technology. Mastering the advantages of core technology can continue to expand the scale of the enterprise, and achieve the goal of maximizing the profit and income of the enterprise.

The increase in corporate cash flow brought by the reduction of VAT rate. However, different regions and industries differ greatly in their ability to attract investment, which may lead to unfair tax burdens among manufacturing industries and enterprises. First, companies in different geographical locations have different abilities to attract investment. Enterprises in developed cities and regions have stronger ability to attract investment, while manufacturing enterprises in underdeveloped regions have weaker ability to attract investment. Second, investment intensity varies in different manufacturing industries. For capital-intensive manufacturing enterprises, the extra cash flow can be used to invest a large number of fixed assets and increase the production scale

and production efficiency. But for labor-intensive manufacturing enterprises, there is less need to invest in fixed assets. Enterprises with less investment will not enjoy tax incentives, resulting in higher tax burden for enterprises with less investment or less investment needs.

3 Result

As of December 2019, the policy of VAT rate reduction has been in effect for nine months. This study will analyze the specific impact of VAT rate reduction on enterprises and make theoretical analysis.

According to the national data, the profit increase caused by the VAT rate reduction is not obvious. As of December 2019, the total profit of the manufacturing industry increased by -5.2% from the previous year, and the profit of the manufacturing industry fell instead of rising. The profit decline is mainly concentrated in the product processing industry, including petroleum, coal, chemical raw material manufacturing, ferrous metal products smelting industry.

From a cost perspective, before the implementation of the VAT reform, manufacturing operating costs increased by 7.8% compared with last year. As of December 2019, manufacturing costs increased by 3.9% over the previous year, indicating that the VAT reform has had a significant impact on reducing manufacturing costs. The cost growth of most manufacturing industries has decreased after the implementation of VAT reform. Among them, the industries with larger cost decreases include tobacco products, textile and clothing, clothing, paper and paper products, printing and recording media reproduction, etc. After the VAT reform, the purchasing price index of industrial producers continued to decline, and the raw material cost of enterprises showed a downward trend (Fig. 1).

Before the VAT reform, the operating income of the manufacturing sector increased by 7.2% year-on-year. In the year to December 2019, the cumulative operating income of the manufacturing sector increased 3.7% from the same period last year. Revenue growth

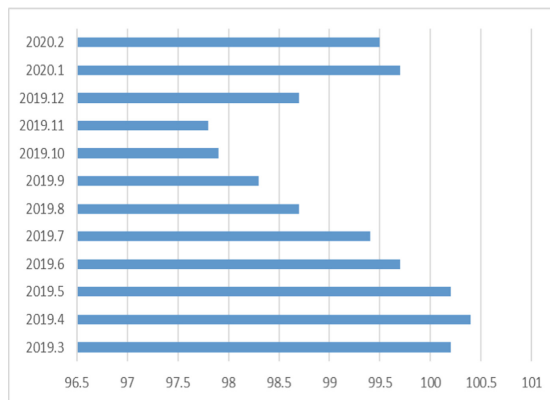


Fig. 1. Industrial Producer purchasing Price Index (same month last year = 100)

was significantly lower than before the VAT reform. The trend of producer price index of living materials industry is always on the rise before and after the implementation of VAT reform, which is similar to the trend of consumer price index (Fig. 2).

The producer price index of the means of production showed an obvious downward trend after the implementation of VAT reform (Fig. 3).

Before the implementation of the VAT reform, the cumulative investment income of the manufacturing sector fell by -0.6% compared with the same period last year. After the implementation of the VAT reform, the cumulative investment income of the manufacturing industry increased by 10.1% over the same period last year (Fig. 4).

Investment in high-tech instrument and equipment manufacturing increased significantly after the VAT reform (year-on-year growth was 14.1%). In addition, investment in high-tech instrument and equipment manufacturing increased by 14.8% year-on-year in the first half of the year, and the good momentum of accelerating the operation of the manufacturing sector has continued for six months after the implementation of the VAT system reform.

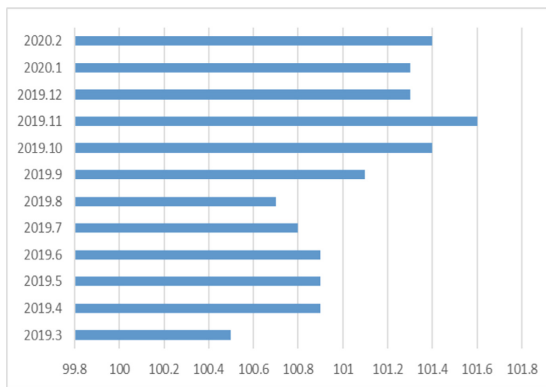


Fig. 2. Producer Price Index for Consumer Goods (same month last year = 100)

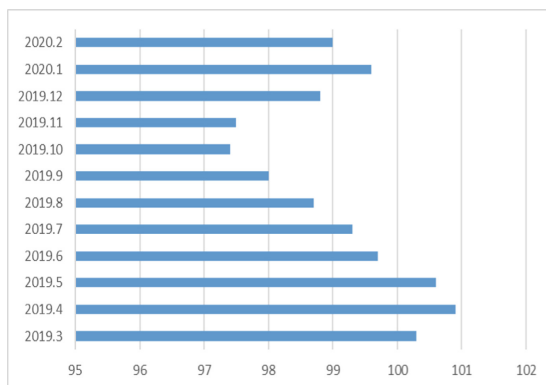


Fig. 3. Producer price Index for Means of Production (same month last year = 100)

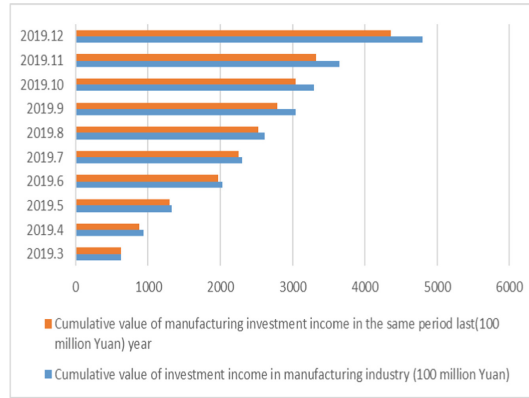


Fig. 4. Income from manufacturing investment

4 Discussion

According to the data, the reduction of VAT rate has a significant restraining effect on the cost rise of manufacturing enterprises. The increase of operating costs of most manufacturing enterprises decreased, and the purchasing price index of industrial producers showed a downward trend after the VAT reform. The decrease of VAT rate reduces the cost of upstream enterprises, which is the direct reason for the decrease of raw material purchase price of enterprises. Some of the tax benefits obtained by upstream companies are taken up by downstream manufacturing companies.

After the VAT rate reduction, the income of manufacturing enterprises decreased, which was mainly reflected in the decline of producer prices of means of production. This is because manufacturers have lowered the prices of their products, leading to lower revenues. In terms of means of living, ppi of means of living industry is not affected by VAT reform. This shows that the buyers of means of living are weak in the market and cannot obtain price concessions through price negotiation.

The main reasons for the sharp decline in profitability of large manufacturing companies are complex. First, the sales of industrial products above the scale of business revenue growth declined. The operating cost income of large and medium-sized industrial enterprises above designated size increased by 3.8% year-on-year, down 4.8% from the same period last year. Second, the steel, petrochemical, automotive and other key products of the processing industry profits declined. In 2019, profits of key industries such as steel, chemical, automobile and petroleum processing fell 37.6%, 25.6%, 15.9% and 42.5% year-on-year, respectively. The impact on the profit growth of industrial enterprises above designated size was 7.4% points lower than the previous year. Third, individual industries and enterprises draw substantial asset impairment losses.

There are obvious flaws in China's VAT collection system. Although China's fight against false VAT invoices is increasing, but the phenomenon of false VAT invoices still exists. In the process of falsely issuing VAT invoices, the basic sales of goods or services are not generated, but only the sales of VAT invoices are actually carried out. China should draw lessons from the experience of sci-tech VAT collection and management,

develop information technology, and pay attention to the balance between improving tax efficiency and protecting the legitimate rights and interests of enterprises. China should try out science and technology tax collection and management system, so that lawless people have no chance to falsely write VAT invoices.

5 Conclusion

To sum up, the reduction of VAT rate will have a great impact on China's manufacturing enterprises. The VAT reform will reduce the tax burden on enterprises, increase profits and promote investment. Data in 2019 show that the VAT reform has indeed brought many benefits to the development of enterprises. VAT reform will still accelerate the development and transformation of enterprises in the future, and continue to help China's manufacturing enterprises gain advantages in international competition. However, in the early stage of VAT reform, there will still be a series of problems, such as the blind expansion of enterprises, unfair tax burden, flaws in China's VAT collection system, tax preference is completely occupied by a certain enterprise. These problems still require effective measures by the state and enterprises to avoid.

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