
The Influence Mechanism and Effect of Foreign Capital Entering to the Changes of China's Industrial Sectors Price

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Abstract: In recent years, many scholars attributed the phenomenon of "price manipulation" and "mutually negotiated price" frequently reported in the media to the control of foreign companies in the industry. However, there are also some scholars who held the opposite view that none of the foreign-invested enterprises has raised prices of their products. To this end, this study analyzed the influence mechanism and effect of foreign capital entering to the changes of china's industrial sectors price using panel data of China's industrial sectors. The study found that: the entry of foreign capital influenced the change of China's industrial sectors price through raising labor productivity and weakening monopoly power. Research results indicate that, since China's reform and opening up, the entry of foreign capital promoted the raising of the Chinese industry sectors labor productivity, weakening monopoly power of some industry in China, reducing China's industrial sectors prices and curbing inflation on the whole, thereby it improved the level of the Chinese social welfare.

Keywords: Foreign Capital's Entry, Labor Productivity, Monopoly Power, Price Change

1. Introduction

Since the reform and opening up, along with the development of economy and investment environment, foreign investors have made large-scale systematic investments in China. According to the 2019 World Investment Report: In the context of the sharp decline in global foreign direct investment in recent years, foreign investment in China has maintained steady growth, and the structure and quality of foreign investment have improved, thanks to the huge market and the complete industrial chain. Among other advantages, China is still one of the most attractive investment destinations in the world. In 2018, China's foreign capital inflows reached USD134.97 billion, 47,736 foreign-invested enterprises, accounting for 12.61% of the industrial enterprises above designated size, and foreign-invested enterprises realized a profit of nearly 1.7 trillion yuan, accounting for 25.3% of the total profits of industrial enterprises above designated size; The total value of imports and exports of invested enterprises was 19681 billion US dollars, accounting for 42.6% of the national total. This shows that the entry of foreign capital played an important role in alleviating the bottleneck of China's capital

accumulation and promoting economic development. However, due to the long-term implementation of the super national treatment policy for foreign investment, foreign investment has monopolized and controlled certain industries in China [1-3]. A research report of the Research and Development Center of the State Council pointed out that in 21 of the 28 major open industries in China, most of the assets were already controlled by foreigners. Such as: in the home appliance industry of the 18 state-level designated enterprises in China, 11 had been joint ventures with foreign companies, the five largest companies in the glass industry were all joint ventures, and 20% of the assets of the pharmaceutical industry were occupied by foreign capital, the cosmetics industry is controlled by 150 foreign-invested companies; and 90% of the automotive industry's sales come from foreign brands. From the perspective of the changing market share of foreign-funded enterprises in China's industrial sector, the market share of foreign-funded enterprises has experienced a change process of first increasing and then decreasing, the market share of foreign-invested enterprises increased from 17.04% in 1995 to a peak of 32.73% in 2004, after 2004, the market share of foreign-funded enterprises decreased year by year and

dropped to 21.85% in 2018, However, such as the manufacturing industry of communication equipment, computer and other electronic equipment and transportation equipment, the market share of foreign-invested enterprises were still remained high. In 2018, the market share of foreign-invested enterprises in the market of these two industries were as high as 54.67% and 45.80% respectively, while the market share of foreign-invested enterprises in another seven industrial sectors also exceeded the warning line (30%) with respect to market control in ordinary industries, and the total number of industries where the warning line had been exceeded amounted to nearly 1/4. In recent years, many scholars also attributed the phenomenon of "price manipulation" and "mutually negotiated price" frequently reported in the media to the control of foreign companies in the industry [4-10]. However, there are also some scholars who held the opposite view that the expansion of market share of the industry occupied by foreign-invested enterprises should not be simply equivalent to foreign monopoly [11-13]. Although there is a higher share of foreign-invested enterprises in the market of a few industries, none of the foreign-invested enterprises has established a monopoly in their industries and raised prices of their products. On the contrary, industries controlled by state-owned capital exhibit more obvious monopoly characteristics and is the main cause of the price rise in China's industrial sector [14-16].

Therefore, this raises interesting and important topic: does foreign investment affect the price changes of China's industrial sector? If so, what is the impact? What is the

mechanism of influence? Correctly answers to these questions are great significance for relevant government departments in formulating foreign investment entry and antitrust policies. There are two main questions of answers in this article: First, what is the impact mechanism of foreign investment on price changes in China's industrial sector? Second, what specific impact does foreign investment have on price changes in China's industrial sector? To answer these questions, this paper draws on existing literature and studies the impact mechanism and effect of foreign investment on price changes in China's industrial sector from a dual perspective of labor productivity and monopoly power, so as to provide insights for relevant governmental departments in terms of establishing policies on foreign investment's entry and anti-monopoly.

2. Empirical Model, Variables and Estimation Methods

2.1. Empirical Model and Variables

To verify the impact mechanism and effect of foreign capital's entry into China on the price changes in China's industrial sector, we introduce a simultaneous equations model to observe the impact of foreign investment on labor productivity and monopoly power, as well as the impact of labor productivity and monopoly power on price change in China's industrial sector. Then we get:

$$\begin{cases} \Delta \ln p_{i,t} = \alpha^p + \beta_1^p \Delta \ln f_{i,t} + \beta_2^p \Delta \ln Z_{i,t} + \beta_3^p \Delta \ln \mu_{i,t} + \beta_4^p \Delta \ln cpi_t + \beta_5^p \ln f_{i,t-1} \\ \quad + \beta_6^p \ln Z_{i,t-1} + \beta_7^p \ln \mu_{i,t-1} + \beta_8^p \ln cpi_{t-1} + \beta_9^p \ln p_{i,t-1} + u_{i,t}^p \\ \Delta \ln Z_{i,t} = \alpha^z + \beta_1^z \Delta \ln f_{i,t} + \beta_2^z \Delta \ln size_{i,t} + \beta_3^z \Delta \ln rd_{i,t} + \beta_4^z \ln f_{i,t-1} \\ \quad + \beta_5^z \ln size_{i,t-1} + \beta_6^z \ln rd_{i,t-1} + \beta_7^z \ln Z_{i,t-1} + u_{i,t}^z \\ \Delta \ln \mu_{i,t} = \alpha^\mu + \beta_1^\mu \Delta \ln f_{i,t} + \beta_2^\mu \Delta \ln CU_{i,t} + \beta_3^\mu \ln f_{i,t-1} + \beta_4^\mu \ln CU_{i,t-1} + \beta_5^\mu \ln \mu_{i,t-1} + u_{i,t}^\mu \end{cases} \quad (1)$$

The above model contains the price equation, labor productivity equation and monopoly power equation. The dependent variable of price equation is $\Delta \ln p_{it}$, denotes the price change in industrial sector i in period t . $\Delta \ln f_{it}$ represents the change of foreign investment in industry i in period t . $\Delta \ln Z_{it}$ represents the change in the labor productivity of industry i in period t . $\Delta \ln \mu_{it}$ denotes the change in monopoly power in industry i in period t . $\Delta \ln cpi_t$ represents the change in the consumer price index of period t . $\ln f_{i,t-1}$, $\ln Z_{i,t-1}$, $\ln \mu_{i,t-1}$, $\ln cpi_{t-1}$ and $\ln p_{i,t-1}$ respectively represent lagged foreign investment, lagged labor productivity, lagged monopoly power, lagged overall price level, and lagged price situation in industries. The change in foreign investment, lagged foreign investment and lagged labor productivity are introduced into the labor productivity equation. In addition to the above three variables, the average size of enterprises and technology expenditure are important factors influencing the change of labor productivity, and the above two indicators do

not direct impact on the price change and monopoly power in the industrial sector. Therefore, Average firm size ($\ln size$) and industrial technology spending ($\ln rd$) are introduced into the labor productivity equation as instrumental variables (IVs) of labor productivity. Average firm size ($\ln size$) is measured by the average number of employees of firms in the industry. The technology spending ($\ln rd$) is measured by the proportion of the expenditure on science and technology activities to the gross output value in the industry. Variables such as the change in foreign investment, lagged foreign investment and lagged monopoly power are introduced into the monopoly power equation.

2.2. Source of Data

This paper uses panel data of all industrial sectors in China's two-digit code from 1999 to 2012 for empirical analysis. The data obtained from "China Statistical Yearbook" from 2000 to 2013, "China Industrial Economic

Statistics Yearbook" from 2000 to 2013, "China Population and Employment Statistics Yearbook" from 2000 to 2013 and "China Science and Technology Statistics Yearbook" from 2000 to 2013. Because the Bureau of Statistics revised the national economic industry classification and codes twice in 2002 and 2011, the names and codes of some industries in these three consecutive ranges from 1999 to 2002, 2003 to 2011, and 2012 have changed. In order to avoid discrepancies in the statistical scope, the two-digit code industries in 2002 and 2011 are matched by the industry name and content. In addition, the PPI of the industrial sectors are based on the 2002 national economic industry classification. Therefore, the industry code name from 2003 to 2011 is used as the matching standard for the binary code industry. The industry that appeared only in 1999-2002 or 2012 but was not included in the statistics of 2003-2011 are excluded in order to ensure the consistency of industry codes and names. The resulting sample includes 36 industries with two-digit codes and a total of 504 observation points.

3. Econometric Analysis and Results

Table 1 lists the estimation results of the simultaneous equation model. The purpose of the simultaneous equation model is to determine whether foreign investment entry affects the price changes of China's industrial industry through labor productivity and monopoly power, and how big influence is. Columns (1)-(3) are the estimation results that contain only the main independent variables, that is, the price equation in column (1) includes only independent variables such as foreign investment entry, labor productivity, monopoly power, and lagging industrial prices. The labor productivity equation in column (2) and the monopoly power equation in column (3) only include the dependent variables of foreign investment entry and lagged dependent variables. From the estimation results of the price equation in column (1), the coefficients of short-term foreign investment entry and long-term foreign investment entry are both negative, which indicates foreign investment entry has a restraining effect on the rise of industrial prices, but neither is significant. The coefficients of short-term and long-term labor productivity are negative, and the coefficients of short-term and long-term monopoly power are positive. The estimated results of the labor productivity equation in column (2) show that the coefficients of short-term foreign investment entry and long-term foreign investment entry are significantly positive, which indicates that both long-term and short-term

foreign investment entry can promote labor productivity growth, and the coefficient of the lagged labor productivity is significantly negative, which indicates that the adjustment effect of labor productivity from non-equilibrium state to equilibrium state is significant. The estimation results of the monopoly power equation in column (3) show that the coefficients of short-term foreign investment entry and long-term foreign investment entry are both negative, which indicates that both long-term and short-term foreign investment entry can inhibit the growth of monopoly power, but the effects are not significant in the short term, the lag period of monopoly power is also significantly negative, which indicates that the adjustment effect of monopoly power from non-equilibrium state to equilibrium state is significant. Columns (4)-(6) present the estimates that include all independent variables. The estimated coefficients of the main independent variables are consistent with the estimates in columns (1)-(3). In addition, from the estimation results of the price equation in column (4), it is found that the long-term overall price level is negatively correlated with price changes in the industrial sectors, and the short-term overall price level is positively correlated with price changes in the industrial sectors, which is in line with the estimates in column (1). The estimated results of the labor productivity equation in column (5) show that the average size of the enterprise is negatively correlated with labor productivity in the short and long term, and is significant at a significant level of 10%. This may be caused by the non-increasing returns to scale in some industries. Technology spending is positively correlated with labor productivity in the short or long term, this shows that technology spending has a role in promoting labor productivity. The estimation result of the monopoly power equation in column (6) is consistent with the results in column (3), and thus analysis is not repeated here. According to the estimation results in Table 1, we find that foreign investment mainly affects the price changes of China's industrial sectors indirectly through labor productivity and monopoly power, and foreign investment has held down prices in China's industrial sectors by increasing labor productivity and weakening monopoly power. In addition, according to the comparison of the coefficients, it can be seen that, in the short term, foreign capital entry strongly inhibits the price rise in China's industrial sectors through improving labor productivity, and in the long run, foreign capital entry has a strong inhibitory effect on the price increase of the Chinese industrial sectors by weakening monopoly power.

Table 1. Effects of foreign investment on price changes in China's industrial sector.

Variable	Considering only the key independent variables			Considering all the independent variables		
	(1)	(2)	(3)	(4)	(5)	(6)
$\Delta \ln p$				$\Delta \ln p$		
$\Delta \ln Z$		$\Delta \ln Z$			$\Delta \ln Z$	
$\Delta \ln \mu$			$\Delta \ln \mu$			$\Delta \ln \mu$
$\Delta \ln size$					-0.1511* (-1.79)	
$\Delta \ln rd$					0.0092 (0.50)	
	-0.0053 (-0.67)	0.3724** (2.33)	-0.0121 (-0.48)	-0.0093 (-1.22)	0.3659** (2.24)	-0.0139 (-0.91)
	-0.1087*** (-4.91)			-0.0937*** (-3.78)		
	0.7232*** (6.54)			0.6292*** (3.92)		

Variable	Considering only the key independent variables			Considering all the independent variables		
	(1)	(2)	(3)	(4)	(5)	(6)
	$\Delta \ln p$	$\Delta \ln Z$	$\Delta \ln \mu$	$\Delta \ln p$	$\Delta \ln Z$	$\Delta \ln \mu$
$\Delta \ln cpi$				1.3071*** (6.71)		
$\ln f_{t-1}$	-0.1081 (-1.32)	0.1892* (1.94)	-0.0308** (-2.20)	-0.0893 (-1.38)	0.1809* (1.82)	-0.0261** (-2.33)
$\ln Z_{t-1}$	-0.0186** (-2.22)	-0.1441*** (-8.63)		-0.0336** (-1.93)	-0.1322*** (-7.78)	
$\ln \mu_{t-1}$	0.5291*** (3.86)		-0.3382*** (-5.08)	0.7451*** (2.88)		-0.3692*** (-10.50)
$\ln size_{t-1}$					-0.2501*** (-3.80)	
$\ln rd_{t-1}$					0.1006*** (5.22)	
$\ln cpi_{t-1}$				-0.3772 (-1.62)		
$\ln p_{t-1}$	-0.2101*** (-4.66)			-0.2973*** (-3.40)		
$_{-cons}$	0.9563*** (4.80)	0.5452*** (5.54)	0.1268*** (4.09)	-0.4266 (-0.59)	0.4981*** (4.40)	0.1202*** (8.60)
N	468	468	468	468	468	468

Notes: ***, **, and * represent being significant at the 1%, 5% and 10% level respectively. The values inside the parentheses are Z-value statistics.

4. Conclusion

This paper draws on existing literature and studies the impact mechanism and effect of foreign investment on price changes in China's industrial sector from a dual perspective of labor productivity and monopoly power.

The main conclusions of this paper are as follows. Whether in the short-term or in the long-term, foreign capital entry affects the price changes of China's industrial sectors by increasing labor productivity and weakening monopoly power. In the short term, foreign capital entry strongly inhibits the price rise in China's industrial sectors through improving labor productivity, and in the long run, foreign capital entry has a strong inhibitory effect on the price increase of the Chinese industrial sectors by weakening monopoly power.

The conclusion of this paper shows that the policy of actively introducing and utilizing foreign capital adopted by China since the reform and opening up is completely correct. Therefore, the latter stage should work hard on the following two tasks: One is to further improve the utilization of foreign capital. The other task is to improve the quality of foreign capital.

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