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The Measures and Effects of Strategic Trade Policy Promoting Automotive Industry Development in Japan

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Abstract
The core idea of strategic trade policy is, under imperfect competition and economies of scale, government can promote the development of domestic industries with restrictive import policy and subsidies export policy. Japan is a successful example of promoting the development of domestic automobile industry with strategic trade policy. According to the different characters of initial stage, rapid growth period and mature period of industry development, Japan has implemented restriction import, subsidies export and encouraging foreign investment policy. These policies have promoted greatly the development of automobile industry, improved the international competitiveness and stimulated economic growth. China should learn from Japanese experience to formulate trade policy and industrial policy according to the different stage of industry development. Meanwhile, China should also pay attention to cultivating industrial capability of independent development and innovation ability.

Key words: Strategic trade policy; Japanese automobile industry; Industry development; Measures and effects

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INTRODUCTION
The strategic trade policy theory had been proposed in the background of America's global standing in the world economy declined, the emergence of new trade features and the application of industrial economic analysis tool in 1980s (Krugman, 1986). At that time, with the rising international competitiveness of Japan and other economies, America's economic position in the world was challenged, and the international competitiveness of major industries declined. America has to change the traditional trade policy, explore new trade policies to protect and promote the development of domestic industries. Meanwhile, in the field of international trade, intra-industry trade, multinational trade and other new business models are emerging. The analysis tools of industrial organization theory and market structure theory continue to be applied to international trade research. For these new changes, the traditional trade theory cannot explain the new phenomena very well. In this context, western scholars have proposed a new trade theory, namely the strategic trade policy theory. The core idea of strategic trade policy is, under imperfect competition and economies of scale, government can promote the development of domestic industries with restrictive import policy and subsidies export policy, and obtain additional monopoly interests.

Japan is a successful example of promoting the automobile industry development with strategic trade policy. Automobile industry is the pillar industry of Japanese economy, and has a strong role in promoting economic growth. After World War II, Japan has implemented a series of strategic trade policy on the automotive industry, including restrictive import policy, subsidies export policy and subsidies R & D policy. These policies have promoted the rapid development of automobile industry. The automobile industry also has an important position in China. Since the reform and opening up, China has implemented a series of trade policy and industrial policy to promote the development

of the automobile industry, and have played a positive role. However, the current Chinese automobile industry is big but not strong. Automotive industry is still facing the problem of weak core components R&D capacity, low business efficiency and poor international competitiveness. How to use strategic trade policy and industrial policy to enhance the international competitiveness of Chinese automobile industry is an important task to China. Therefore, it is necessary to study the measures and effects of strategic trade policy to promote automotive industry development of Japan. Learning the experience of Japan has important significance to China speeding up the development of automobile industry.

1. LITERATURE REVIEW

1.1 Researches on the Strategic Trade Policy

Brander and Spence have originally proposed the strategic trade policy theory in 1981. They use the Cournot duopoly competition model to prove that government can make domestic enterprises to obtain more profit with tariffs, subsidies and other policies (Brander & Spence, 1981). Krugman has described the background and the core idea of strategic trade policy, and evaluated the effectiveness of the policy (Krugman, 1986). Cline has studied the trade and industrial policies of America's textile, steel and automobile industries, and evaluated the effectiveness of strategic trade policy by empirical methods (Cline, 1986). Dixit has studied the effect of America protecting automobile industry with tariff policy, and finds that raising tariffs help to improve the welfare of American (Dixit, 1988). Cui has studied American strategic trade policy on semiconductor, aircraft and information industry. He believes that strategic trade policy has played an important role in the development of these industries (Cui, 2012).

1.2 Researches on the Japanese Strategic Trade Policy

Some scholars have done researches on strategic trade policy of japan. Baldwin and Krugman have tested the effect of strategic trade policy of Japan's semiconductor industry by the import protection as export promotion model, and conclude that Japanese strategic trade policy promotes industrial development, but harm the interests of consumers (Baldwin & Krugman, 1988). Qiang has analyzed the restriction import policy and subsidies export policy of Japan. He argues that the Japanese protection to domestic industry increases social cost (Qiang, 2001). Tang has studied the industrial policy and trade policy of Japanese automotive industry, and finds that the protection and support policies promote the development of automobile industry (Tang, 2008). Jin has analyzed the development process and characteristics of Japanese strategic trade policy. She concludes that strategic trade policy has a positive role in enhancing industrial competitiveness (Jin, 2011).

In summary, most of the existing researches focus on general theory of strategic trade policy. But the empirical researches on Japan's strategic trade policy from the perspective of promoting industry development are little. The researches on Japanese strategic trade policy on the automotive industry are less. So, this paper will study Japanese strategic trade policy measures to promote the development of the automobile industry and evaluate the effects of these measures. Summarizing the experience of Japan, this article also will make recommendations for China promoting automotive industry development.

2. THE MEASURES OF JAPANESE STRATEGIC TRADE POLICY PROMOTING AUTOMOTIVE INDUSTRY DEVELOPMENT

According to the different characters of initial stage, rapid growth period and mature period of automobile industry development, Japan has implemented restriction import, subsidies export and encouraging foreign investment policy.

2.1 The Measures of Restricting Imports and Protecting Domestic Market

In the early postwar period, the scale of the Japanese automobile enterprises is small, and the competitiveness is low. The production of Japanese automobile was about 32,000, accounting for only 0.3% of the world automobile production in 1950. Facing with this situation, on the one hand, Japanese government has implemented restriction import policy to protect domestic markets; On the other hand, Japanese government has made the technology introduction, industry support and other policies to promote the development of the domestic automotive industry to replace imports.

(a) Restricting imports. In the early postwar period, Japan limited strictly the quantity of automobile import with the measures of strict import approval and foreign exchange allocation. Big cars and trucks by 1961, cars by 1965 began to relax gradually import restrictions. In addition, the tariff is another effective measure to limit automobile imports. Japan imposes high tariffs on imported automobile between relax import restrictions and free trade in the automotive industry. Car import tariff rate was about 40% before 1965, and began to decline gradually until to 1970. During this period, the effect of Japanese trade policy to restrict imports was very obvious. "The proportion of imported cars declined from 44.6% in 1951 to 8.9% in 1955, and to 1% in 1969" (Zhe, 2006, p.281). The restriction import policies of automobile industry win time for the development of domestic automobile industry.

(b) Technological introduction. To narrow the technology gap with foreign countries, Japan actively introduces advanced technology. Under the situation of foreign exchange tense in the early postwar, government allocated preferentially foreign exchange and provided low-interest loans to corporate. Japan imported automobile production technology 488 between 1961- 1974. In these technologies, 274 introduced from the American, 72 introduced from the Federal Republic of Germany, 64 introduced from the United Kingdom, 23 introduced from France and 55 introduced from other countries (Tang, 2008, p.21).

(c) Industry support. Japan has also formulated a series of industry support policies, such as "the main point to support national automobile", "the basic countermeasures of automobile industry ", "the interim measures act on machinery industry revitalization", "special taxation measures law", "road construction emergency measures act" and so on. These policies have provided many favorable for automobile industry. In 1963, government made cars included "domestic machinery procurement act", and required government priority to purchase domestic cars. These policies promote effectively the development of automobile industry. From 1950 to 1965, the annual output of Japanese automobile increased from 32,000 units to 1,876,000 units, and production increased about 59 times.

2.2 The Measures of Encouraging Exports and Promoting Industry Development

After the previous stage of development, to the mid-1960s, the international competitiveness of Japanese automobile industry rose sharply and also had a certain competitive advantage compared with the developed economies of Europe and America. The position of automobile exports in Japanese economy increases rapidly. At this point, the Japanese trade policy on automobile industry begins to change from trade protection to trade liberalization. Industrial policy also changes from direct financing, subsidies and tax cuts to industrial organization optimization and industrial structure upgrading. Due to the slow increasing of the Japanese domestic automobile demand, encouraging exports has become a major task of government in this phase.

(a) Trade and capital liberalization. In the early postwar period, Japan not only limits strictly automobile import quantity, but also controls strictly foreign direct investment in the automobile industry. Into the 1960s, with the competitiveness enhancement of the Japanese automobile industry, Japan began to carry out automobile trade liberalization in 1965 and capital liberalization in 1971. Japan has cancelled gradually restricting imports, attracting foreign investment and foreign investment restrictions. Japanese automobile industry begins to face the international competition.

(b) Encouraging exports. Japan further simplifies export procedures. Government use intermediary organizations to help enterprises to explore overseas markets and use policy-oriented financial institutions to provide financial support for the enterprise. On the financial side, Japan has established the Bank of Japan, the Japanese Export-Import Bank to provide export trade financing instruments and foreign currency mortgages for export enterprises. In the insurance policy, Japan has formulated the export insurance law and the export insurance system to provide a wide range of insurance services for enterprises. On the revenue side, since the 1950s, Japan began to implement tax relief, equipment accelerated depreciation, tax subsidies and other incentives for exporters. These policies promote the automobile exports.

Table 1
Japanese Domestic Automobile Production and Export

Time (years)	1950	1960	1970	1980	1990
Production (unit of 1,000)	32	482	5289	11043	13487
Export (unit of 1,000)	1	39	1087	5967	5831
Export rate (%)	3.13	8.09	20.55	54.03	43.23

Note. Source: Japanese Statistics Bureau; Japan Automobile Manufacturers Association, Inc.

2.3 The Measures of Encouraging Foreign Investment

After the 1980s, the Japanese automobile industry entered the peak period. In 1980, the annual output of Japanese automobile reached to 11.043 million units, becoming the world's largest automobile production country. Automotive industry export reached about 5.722 trillion yen, accounting for 17.4% of Japanese total exports. Japanese car accounted for more than 20% in American imported car market. Because of too much export in automobile, trade friction between Japan and the major developed countries are growing. At this point, the Japanese trade policy on automobile industry begins to turn to overseas investment, technology export. Industrial policy increased support for R & D, and the development of new energy vehicles.

(a) Industrial overseas investment. Automobile industrial trade friction between Japan-US, Japanese and European erupted in 1980. In order to deal with trade friction, Japan carries out the automatic exports market diversification and actively encouraged enterprises to invest overseas. Japan encourages enterprises to remain in the sector of research and core components production at home, and move the assembly and other non-core divisions to overseas. This will not only promote the export of components, and also can enhance Japanese position in the international division of labor. In order to encourage enterprises to invest overseas, Japan formulates "overseas investment insurance", "overseas investment

loss reserve system", "deduct the foreign tax system" and "foreign investment survey fee subsidies". In addition, government and intermediary agencies also provide services on foreign market information and investment advisory for the enterprise.

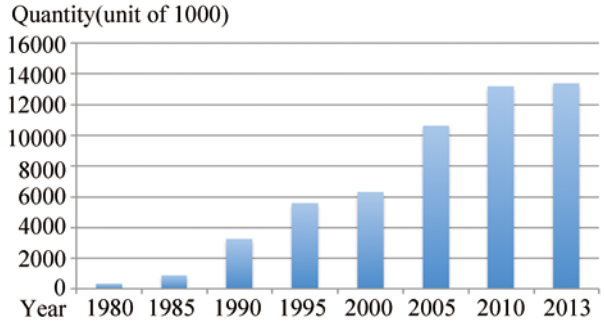

Figure 1
The Automobile Quantity of Japanese Companies Product at Overseas
Note. Source: Japanese Statistics Bureau; Japan Automobile Manufacturers Association, Inc.

(b) R&D support. Entering the 1970s, Japan automobile pollution and safety problems appeared continually. Automobile exhaust pollution and vehicle safety driving technology are getting more and more attention from the society. So, Japan improves the automobile exhaust emission standards, and revised the "road transport vehicle safety standard". Meanwhile, government provides financial support and tax incentives for energy-saving engine and the new energy vehicle development.

3. THE EFFECTS TEST OF JAPANESE AUTOMOBILE INDUSTRY DEVELOPMENT

Evaluating the effects of industrial development requires combination with policy objective and main content. The main objectives of Japanese strategic trade policy to promote industrial development are supporting the strategic industries development, enhancing international competitiveness and promoting economic growth. Therefore, from the three aspects of industrial international competitiveness, promoting the development of related industries and stimulating economic growth, this article will evaluate the effects of Japanese strategic trade policy in promoting automotive industry development between the mid-1960s to the 1990s.

3.1 The International Competitiveness of Automotive Industry

An important index to measure the international competitiveness of the automobile industry is the competitive advantage index, also known as the trade competitiveness index. This index is the proportion of gap between imports and exports of an industry accounted for total imports and exports of the industry. Its value is in the range between -1 and 1. The value tends to 1 indicates that the industry competitiveness is great, tends to -1 indicates that industry competition is weak, and equal to 0 indicates that the industry competition is at the middle level. The calculation formula is as follows:

$$TC=\frac{(\text{Export-import})}{(\text{Export+import})} \quad (1)$$

According to calculations, TC index of Japanese automotive industry in general was rising from 1964 to 1985. Figure 2 shows, the value increased rapidly from 0.606 in 1964 to 0.962 in 1985 years. This indicates that the competitiveness of Japanese automobile industry has been increasing.

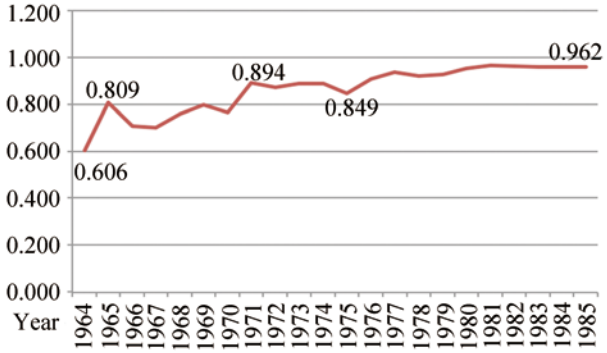

Figure 2
The TC Index Value of Japanese Automobile Industry
Note. Calculations based on Japanese Statistics Bureau, Japanese Ministry of Economy, Trade and Industry data.

Another index that used to measure the international competitiveness of the automotive industry is the international market share. From the mid-1950s to 1980s, Japanese automotive production grew fast. After the 1980s, Japanese companies began to invest large-scale at abroad, and the overseas production and sales of Japanese automotive continued to increase. The domestic and foreign production by Japanese automotive companies accounted for a very high proportion of the world market. Figure 3 shows, in the 1950s, Japanese automotive accounted for less than 1% of the world market, accounted for 30% by the 1980s, and reached to 34.65% of the highest value by 1990. This shows fully that the Japanese automotive industry has a strong international competitiveness.

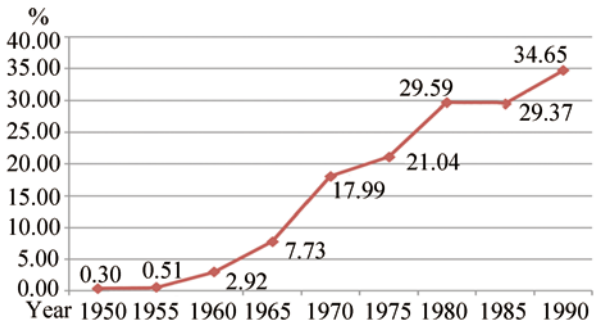

Figure 3
Japanese Share in the World Automobile Market
Note. Source: Japanese Statistics Bureau; Japan Automobile Manufacturers Association.

3.2 The Spillover Effects of Industrial Development

The economic effects of the automobile industry are also reflected in the leading role of the other industries' development. In order to test the leading role of the automobile industry to other industries, this article will do quantitative analysis using the export spillover index of which is also known as the Feder model (Feder, 1982). The model divides the economy into the export sector and non-export sector, and assumes that there are only two elements of capitals and labor. The sources of economic growth mainly come from capital and labor inputs increase, export-led and spillover effects of the export sector. The model examines the effect of export industries on other industries by elastic relationship between the export sector and other sectors. The model equation is as follows:

$$\frac{dY}{Y}=F_k.\frac{I}{Y}+(\frac{L}{Y}.F_l).\frac{dL}{L}+\frac{\delta}{1+\delta}.\frac{dEX}{Y}+\theta(\frac{dEX}{EX}-\frac{dEX}{Y}) . \quad (2)$$

In Equation (2), Y represents GDP, I represents investment, L represents employment and EX represents exports. Wu has revised the model. He has examined the spillover effects of Chinese export sector with panel data models (Wu, 2004). The model equation is as follows:

$$\frac{dY}{Y}=C_0+C_1.(\frac{I}{Y})+C_2.(\frac{dL}{L})+C_3(\frac{dEX}{EX}.\frac{EX}{Y})+C_4(\frac{dEX}{EX}-\frac{dEX}{EX}.\frac{EX}{Y})+u \quad (3)$$

Based on the above model, this paper will revise the relevant variables. Using the variables of GDP, consumer spending, investment, net-exports and the spillover index of automobile industrial net-exports, this paper will test the spillover effect of the Japanese automobile industrial net-exports. Such spillovers may come from external diffusion of technology, management experience and production efficiency. The revised equation as follows:

$$\frac{dY}{Y}=\beta_1\frac{dC}{C}+\beta_2\frac{dI}{I}+\beta_3\frac{dNEX}{NEX}+\beta_4(\frac{dNEXC}{NEXC}-\frac{NEXC}{Y})+\varepsilon \quad (4)$$

In Equation (4), Y represents GDP, C represents consumer expenditure, I represents investment, NEX represents net-exports and NEXC represents net-exports of automotive industry. Data are the annual data of 1965-2012. The data of GDP, consumer expenditure, investment and net-exports are from the Japanese Statistics Bureau. The data of automotive industry net-exports, which are from Japanese Statistics Bureau and Ministry of Economy, Trade and Industry, are the sum of automotive and parts export. Based on the above data, this paper will carry on the regression analysis with the software of Eviews7.2. Results are shown in Table 2.

The results of regression analysis show that D.W. = 1.685232, P values of each variable are significantly less than 0.05 and the goodness of fit R=0.983656. This shows that the independent variables can explain well the dependent variable. In these results, the spillover index of automobile industry net-exports is 0.015855, significantly different from 0. So, we can judge that the automotive industry has the positive spillover effect, and drives the development of other industries.

Table 2
Results of Regression Estimating

Variable	Coefficient	Std. error	*t*-statistic	Prob.
d*C*/*C*	0.714643	0.027823	25.68528	0
d*I*/*I*	0.243623	0.019426	12.54116	0
dnex/nex	0.000453	0.000222	2.045068	0.0469
S.NEXC	0.015855	0.006772	2.341219	0.0238
R	0.983656	S.E. of regression		0.00894
Adjusted *R*	0.982542	Durbin-Watson stat		1.685232

3.3 The Effect of Stimulating Economic Growth

Automobile export is an important part of stimulating economic growth. In Japan, the automobile industry is one of the most important export industries. In 1965-1986, the proportion of automobile and parts of Japanese exports had been rising, and reached to 22.59% by 1986. The automotive industry exports play an important role in promoting Japanese exports.

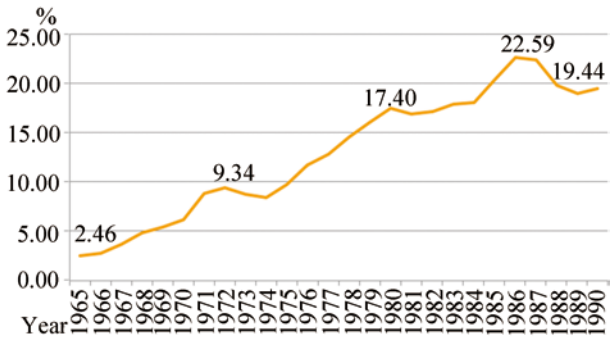

Figure 4
The Proportion of Automotive Industry Exports Accounting for Total Exports of Japan
Note. Source: Japanese Statistics Bureau.

The index of GDP contribution rate is a common index used to evaluate a particular industry to promote economic growth. For further evaluation of the effects of strategic trade policy, this paper use GDP contribution rate of automobile industry exports to quantitative analyze the effect of the Japanese automobile industry on promoting economic growth. The calculation formula is as follows:

$$\text{Contribution}=\frac{\text{Export}}{\text{GDP}}\times 100 . \quad (5)$$

Figure 5 is the calculation results. Results show that, with the rapid development of the Japanese automobile industry, automobile exports' contribution to economic growth rate is rising rapidly. In 1965-1985, the GDP

contribution rate of automobile industry exports rose from the initial 0.26% to 2.95%. This shows that the effect of the Japanese automobile industry on promoting economic growth is obvious.

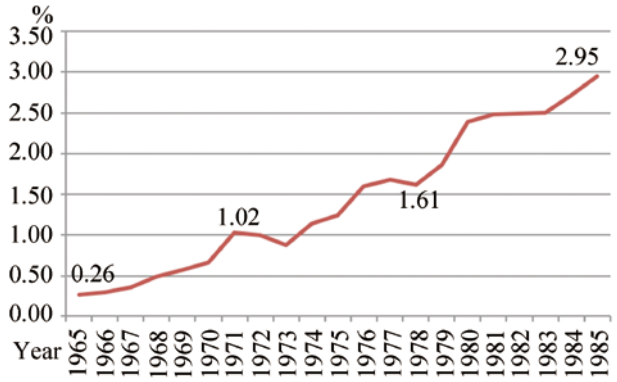

Figure 5
GDP Contribution Rate of Japanese Automobile Industry
Note. Source: Japanese Statistics Bureau; Japanese Ministry of Economy, Trade and Industry.

CONCLUSION AND RECOMMENDATIONS

According to the above analysis, we can see that, from the early postwar period to the mid-1980s, the strategic trade policy implemented by Japan on the automobile industry promotes the development of the industry. Restriction import policy protects the domestic market and wins time for the development of automobile industry. Subsidies export policy enhances the international competitiveness of industry and promote the exports. Encouraging foreign investment policy promotes the domestic enterprises to invest overseas orderly. At the same time, the rapid development of the automobile industry also plays important role in driving other industries development and stimulating economic growth.

However, after the end of the 1980s, Japanese strategic trade policy on automobile industry gradually weakened, and the international competitiveness of automobile industry began to decline. The TC index of automobile industry began to down slowly since 1985, the lowest down to 0.694. International market share of Japanese automobile also began to decline, falling to 26.34% in 2013 and fell by 8.31% compared with the maximum value in 1990. This suggests that Japanese government emphasis too much on the intervention and protection of automobile industry, and ignores cultivating the ability of self-development and innovation. When the strategic trade policy exits, the competitiveness of the automotive industry begins to decline.

Based on the study of the measures and effects of Japanese strategic trade policy on promoting automotive industry development, comparing with Chinese automotive industry, this paper puts forward policy recommendations as follow:

(a) The government should pay attention to matching the trade policy and the industrial development stage. Japanese strategic trade policy has obvious stage characteristics. In formulating the strategic trade policy, Japan is very concerned about the different stages of industrial development, and the industrial international competitiveness. For example, according to the different characters of initial stage, rapid growth period and mature period of industry development, Japan has implemented restriction import, subsidies export and encouraging foreign investment policy. China should also formulate targeted trade policy according to the characteristics of automobile industry development. Chinese automobile industry is now in the early stages of "going out", the domestic market is closing to saturation. Government should take the measures of encouraging exports and trade facilitation to vigorously promote automobile exports.

(b) The government should pay attention to the cooperation of strategic trade policy and industrial policy. In promoting industrial development with strategic trade policy process, Japan pay attention to the cooperation of strategic trade policy and industrial policy and plays a very good effect. China should learn from Japan's experience. When encouraging automobile exports, the government should also increase financial support on enterprises' technological innovation to enhance the international competitiveness of industry.

(c) The government should pay attention to cultivating the ability of self-development and innovation. Japan's experience tells us that the government cannot interfere unduly in promoting industrial development. In the early stages of industrial development, the government should support the industry. With the upgrading of industrial competitiveness, government's support and intervention efforts on the industry should also be gradually weakened. While supporting the development of the automobile industry, the Japanese government ignores cultivating the ability of self-development and innovation. Therefore, in supporting industrial development, China should prevent the over intervention to enterprises.

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