

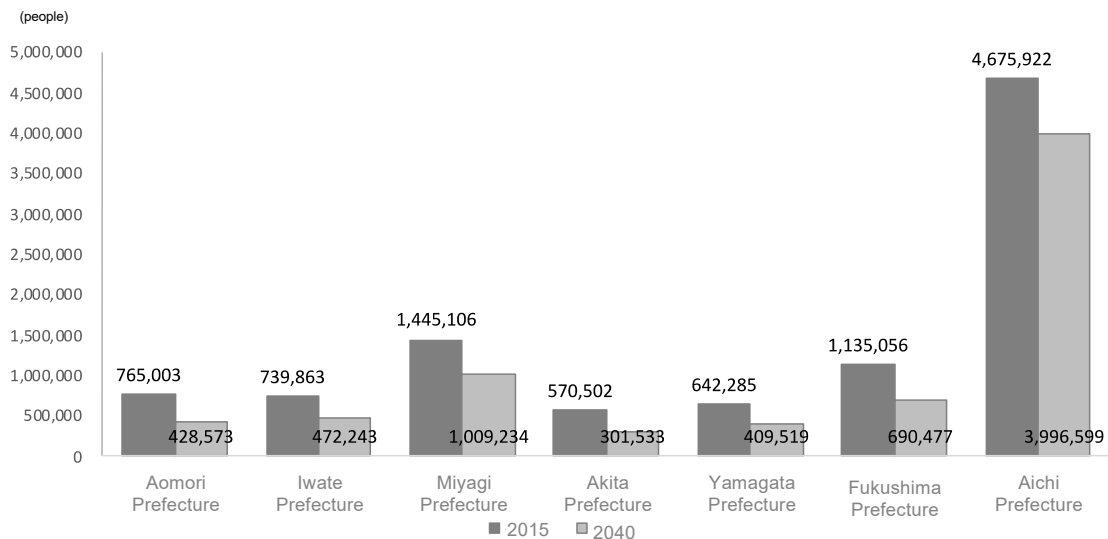
Formation of a Regional Automobile Industry: A Case of the Economic Zone Formed by Toyota Branch Factories in the Tohoku Region

Executive Summary

1. Introduction

This Investigation Report presents the results of analyzing the Tohoku region from the viewpoint of regional automobile industry theory. The regional automobile industry theory herein is defined as a compromise between management strategy theory and regional economy theory, which comprehensively covers the development, production, procurement, and other aspects of the automobile industry in the Tohoku region, as described in “Development of Regional Automobile Industry Theory: The Connection between Core Finished Car Companies and Local Companies in the Tohoku Region” 19-4-8, which is the report on the project for the preceding fiscal year, compiled by the Japan Society for the Promotion of Machine Industry Economic Research Institute [2020]. The regional automobile industry theory is the discussion that places strong emphasis on the serious depopulation in Japan, especially the depopulation rapidly advancing in the region, as the fundamental environmental factor.

Figure 1. Comparison of changes in working age population between the six prefectures of the Tohoku region and Aichi Prefecture



Note) Medium fertility and medium mortality assumptions

Source) Compiled by the author based on the 2018 projection “Regional Population Projections for Japan” by the National Institute of Population and Social Security Research.

As shown in Figure 1, the future working age population, which will shoulder economic activities in the six prefectures of the Tohoku region, is expected to significantly decrease. Compared to Aichi Prefecture, which is the largest manufacturing prefecture in Japan and also home to Toyota Motor Corporation, the total working age population of the six prefectures of the Tohoku region was about 5.3 million as of 2015, which was higher than about 4.68 million of Aichi Prefecture, but will drop below about 4 million of Aichi Prefecture and to about 3.31 million in 2040. Needless to say, this is a comparison between the total of the six prefectures and a single prefecture, and the difference will further widen when compared with the working age population of the three prefectures of the Tokai region with Aichi Prefecture as the core. That is, the difference of the working age population among regions will become more serious.

This project started in FY2016 as an issue that questioned an ideal image of the key industries of each region in such a depopulated society. Then, the subject region of the analysis of the project was the Chugoku region until FY2018 and shifted to the Tohoku region in FY2019 onward. This fiscal year is the last fiscal year as the investigation and research activities subsidized by the Japan Society for the Promotion of Machine Industry Economic Research Institute. The structure of this Investigation Report is as follows: In Introduction, the structure of the key industries and transportation equipment industry of the Tohoku region is outlined based on an industrial statistics table. Following it, under what kind of problem consciousness our research subject, or regional automobile industry theory, developed is summarized. Below are the outlines of the subsequent chapters. Chapter 1 is "Direction of Automobile Industry Agglomerations in the Tohoku Region: Construction of Relationships Based on Public institutions," Chapter 2 is "Agglomerations of Automobile Parts Companies in the Tohoku Region," and Chapter 3 is "Automobile Industry in a Branch Factory Type Economic Zone: Confirmation of Regional Economic Effects Using a Regional Inter-industry Relations Table."

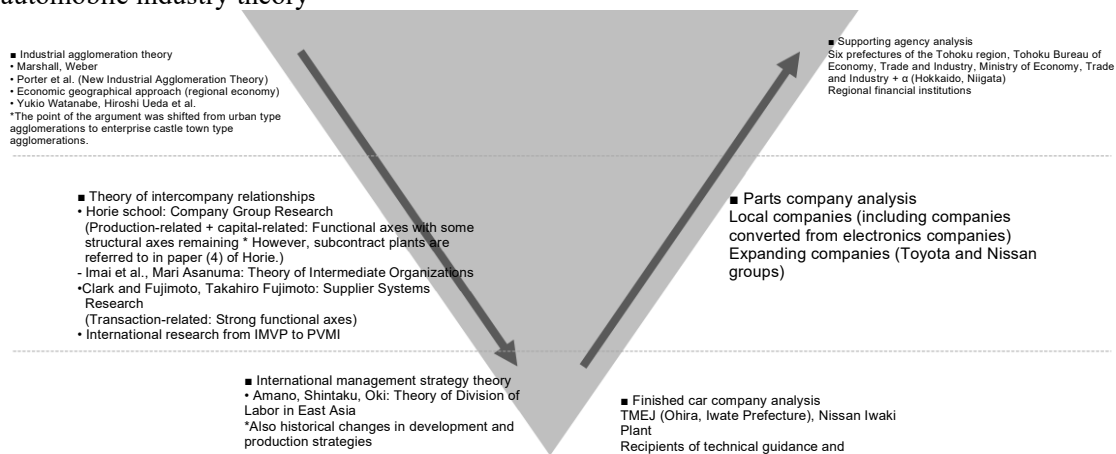
The message underlying the respective chapters of this Report is the limit of the branch factory type economic zone with the automobile industry in the Tohoku region in mind. That is, because of its form, a branch factory is an inconvenient existence that cannot determine quantitative growth and qualitative changes itself. In addition, it should be emphasized that the regional automobile industry bears **structural weaknesses** due to the decrease of the working age population, which is an environmental constraint.

2. Analytical framework of regional automobile industry theory

The next topic is what kind of theoretical background supports the regional automobile industry theory, which this project stands on, and what kind of analysis object it is specifically related to. Figure 2 shows the relationship among the theoretical backgrounds and the analysis objects. The theoretical backgrounds are largely based on three areas.

The first is the industrial agglomeration theory. It originates from the discussion of classical economics and is the area which has been deepened in the fields of medium- and small-sized enterprise theory and economic geography. The concept of enterprise castle town type agglomerations described in the preceding section has been advocated only from the discussion of medium- and small-sized enterprise advocates. Since an industrial agglomeration is selected as the analysis object for the regional automobile industry, this field provides the fundamental point of the argument.

Figure 2. Relationship among theoretical backgrounds and analysis objects in the regional automobile industry theory



Source) Prepared by the author

The second is the theory of intercompany relationships. This field has been deepened by the late Eiichi Horie and researchers in his school line. Although it was understood as a subcontract system of the medium- and small-sized enterprise theory in old times, it was systematized as a discussion of the supplier system by Mr. Takahiro Fujimoto and others after the 1990s. By this framework, it is possible to analyze the relationship within regional automobile industry agglomerations from **relational proximity** and **geographical proximity**.

The third is the international management strategy theory For the regional automobile industry theory, the international division of labor of development and production functions is of particular interest. Since the shrinkage of domestic demand is inevitable in a depopulated society in the long term, companies have no choice but to seek for a growing market in foreign countries. In that process, the point of the argument of how production functions in Japan and overseas countries should be efficiently divided or, first of all, whether they can be divided will become extremely important. In addition to it, it can be said that the actual situation of extraterritorial dependent type agglomerations is close to production plants in foreign countries although they are located in Japan. Thus, the ideal way of the international division of labor can be projected to management between domestic agglomerations in some cases. Previous research in this field would provide such insights.

3. Summary of the points of the argument

Here, the point of the argument of each chapter is summarized below. In Chapter 1 "Direction of Automobile Industry Agglomerations in the Tohoku Region: Construction of Relationships Based on Public institutions," the structure of procuring parts for the CH-R, which is one of the core car models of TMEJ, and the relationship centered around public organizations in the Tohoku region after 2012 were analyzed as the main subjects. With regard to the procurement of parts by TMEJ, it was pointed out that the majority of parts are procured from suppliers outside the region, and a similar conclusion was obtained from an analysis of core car models. In the relationship centered around public organizations, public organizations have tried to raise local companies through seminars etc. and to establish a relationship between finished car companies or parts companies outside the region and local companies through exhibition business meeting, etc. At present, on the premise of such a support system by public organizations, a relationship through which TMEJ and expanding Tier 1 companies improve the capabilities of local companies at the field level is established. It was revealed that extraterritorial dependent, enterprise castle town type agglomerations are maintained by the relationship centered around public organizations as described above.

In Chapter 2 "Agglomerations of Automobile Parts Companies in the Tohoku Region," we scrutinized materials compiled by each prefecture regarding automobile-related companies in the prefecture, and clarified the overall image of the agglomerations of automobile parts companies in Iwate, Miyagi, and Fukushima Prefectures, which are the centers of the automobile industry in the Tohoku region. As a result of the analysis, the following six points were presented: The first point is that the ratio of parts companies outside the region has been on the increase. The second point is that the majority of Tier 1 companies are leading companies outside the region. The third point is that the majority of local parts companies have been operated since before the foundation of the Iwate, Ohira, and Iwaki Plants. The fourth point is that there is a local parts company engaged in on-vehicle electronic components only in Iwate Prefecture. The fifth point is that there is a local software company in Iwate and Miyagi Prefectures. And the sixth point is that there are no on-vehicle electronic components and software companies in Fukushima Prefecture.

The discussion in Chapter 3 is "Automobile Industry in a Branch Factory Type Economic Zone: Confirmation of Regional Economic Effects Using a Regional Inter-industry Relations Table" is as follows: In the Tohoku region, which is the focus of this Report, a transaction structure is constructed with branch factories of finished car companies at the core. It was revealed by an investigation conducted in the preceding fiscal year that the majority of transactions are parts transactions from outside the region, and the "depth" of local procurement is presumed to be shallow. In this chapter, an attempt was made, with a regional inter-industry relations table used as an analysis tool, to visualize the intra-regional and extra-regional transactions of parts (or services) related to the automobile industry in the prefectures where the automobile industry is a core industry. And, by attempting a comparison with other regions, we intended to extract the actual state of transaction structures especially in the branch factory type economic zone of the Tohoku region. As a conclusion, it was impossible to make an attempt to extract the differences in transaction structures by agglomeration type or by core company using a regional inter-industry relations table. An agglomeration is viewed in terms of spatial area, and the transaction structure of the automobile industry cannot be visualized on a prefectural basis. However, showing deemed

self-sufficiency amounts and self-sufficiency rates is considered to be useful because they become indicators for promoting support by administrative organizations to activities for attracting companies and companies in the region.

4. Outstanding issues

The hitting points of this Investigation Report are as mentioned above. Finally, outstanding issues are presented here. In this fiscal year, COVID-19, which originated from Wuhan City in China from the end of last year, raged all over the world, and all investigation activities inside and outside Japan were interrupted. We initially planned to increase the number of days of visiting the Tohoku region and continue to conduct large-scale investigations in FY2020 based on the interviews held in Iwate and Miyagi Prefectures and the investigations of core companies, including TMEJ and Aisin Tohoku in both prefectures, conducted in FY2019. Contrary to our intention, the contents of this Investigation Report are only data excerpted from past investigation records and data obtained by analyzing secondary materials. In FY2021, we must recover the delay of the investigations. This fiscal year is the last fiscal year of research subsidies by the Japan Society for the Promotion of Machine Industry Economic Research Institute. However, we will continue this project and compile the research outcomes into a book like the First Term Investigation and Research Program to propose policies to the Tohoku region.