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主 論 文 の 要 旨

論文題目	The Path of Trade and Economic Development in East Asian Countries (東アジア諸国の貿易と経済発展)
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論 文 内 容 の 要 旨

1. Introduction

Economic development in East Asian region has been extensively studied due to its dramatic achievement. Among others, this thesis concentrates on China, Japan, and Korea due to their similarities. Although there are differences in the period and strategy, the economic growth of China, Japan, and Korea (CJK) has been progressed in a similar way. The growth of the three countries shares characteristic features. Akamatsu observed those similarities and suggests Flying Geese Paradigm. It explains the regional transmission of economic development. According to existing literatures, the pattern of economic growth, a macro-level observation, of the three countries is similar. But, in micro-level, development strategies are different: for example, the role of government and role and pattern of export. However, exports of the three countries have developed somewhat differently due to different export expansion strategies. Thus, it is necessary to diagnose the direction of export expansion in order to examine the export development paths.

Specifically, a country can extend their domain by exporting a new product or pioneering a new market. They are called extensive margins. Inversely, intensive margins indicate growth of existing export ties. One can decompose the path of export growth into extensive and intensive margins. Analysis of the synchronization of export structure gives the information of the direction of the change. For example, comparing the similarity of export structures between China and Korea in the global market reflects China's catch-up with respect to Korea. Processing trade of China also should be analyzed in the analysis due to its special contribution to exports.

Existing studies have some limitations: the range of analysis and the methodological limitation. Thus, the purpose of the thesis is to analyze the export development path of the three countries. For the purpose, the thesis has three following specific objectives.

1. **Decompose the extent of export growth of East Asian countries**
2. **Develop a bilateral similarity index improving and generalizing existing concepts**
3. **Analysis the effect of China's processing trade on China's export development**

Each objective is dealt in a single chapter is related with two detailed research questions.

Methodologically, various empirical approaches and theoretic development are used. The Theil index is adopted to evaluate export diversity of countries. Further decomposition of the index is conducted to dichotomize extensive and intensive margins of export. Econometric methods were also adopted for estimations. For example, Kaplan-Meier estimate is applied to check the frailty of exports.

Theoretic developments can be considered the key contribution of this thesis. To achieve the second objective, the thesis suggests a novel bilateral similarity concept which generalizes existing concepts. As for the third objective, the thesis extend cost-discovery model of Hausman (2007). Specifically, the modified model eliminated strict assumptions and adopted a new factor – possibility of processing trade.

2. Diversity of Export

A country can more easily diversify export portfolio of products if the importing countries have similar income level of the exporter. The diversification pattern of export over product reflects economic development level of exporting countries. However, there are two possibility of the diversification. Countries can extend their domain of export by shipping a new product or pioneering a new market. Those increase which called "extensive margins" diversify export structure. Also, rebalancing existing export portfolio also can diversify export structure. However, the frailty of new exports may hinder extensive margins to be a major factor of diversification. Thus, the objective of this chapter is to decompose the extent of export growth of CJK. For the objective, there are two specific research questions as follows.

1) **Does the export development of China, Japan, and Korea depend on extensive margins: extension of new products or new markets?**
2) **What are the survival rates of new export ties of the three countries?**

As for the first research question, the results are as follows.

1-a) The Theil index indicates intensive margin as the key of export growth of the three.

1-b) Contributions to export growth by new products were very low (under 5 percent).

1-c) Utilization ratio over product-destination pairs bolsters China's market expansion.

Survival analysis is added to find out the long-term characteristic of intensive margins. The results can be summarized as follows.

2-a) China has shown high survival rate than Japan and Korea.

2-b) China's survival rate has been high especially in developed markets.

Most importantly, the result characterizes China's export development path. China has a stable export experience to high income countries. It is supported by the exceptionally high export

survival rate to high income countries. However, China has been specialized their export products to high income countries while they successfully diversified its exports by expanding the region. Those seemingly unrelated observations imply that China has not yet reached the stage of producing various sophisticated items.

3. Generalized Measure of Similarity

Comparing a country's trade structure with another one gives various implications. Similarity has been at the heart of seminal works comparing trade structures. However, intrinsic limitations of existing concepts come from two assumptions about quality homogeneity and linearity.

The main objective of this chapter is developing a bilateral similarity index which improves and generalizes existing concepts. The other objective of the chapter is measuring change in export pattern of CJK since their seemingly similar export structure should be re-evaluated considering quality aspects. Thus, there are two specific research questions.

1) **Can existing bilateral similarity indices be generalized? Can generalization yield any different results from the present?**

2) **Has export similarity of Korea, China and Japan increased? Is it also when considering quality?**

As for the first question, answers can be summarized as follows.

1-a) A new index is introduced to relieve two limitations of existing indices.

1-b) It generalizes existing concepts and its effectiveness has been justified by simulations.

The results for the second question can be described as follows.

2-a) As a result of evaluating the similarity of manufacturing exports by country pairs using traditional ESI, Chinese exports have substantial overlapping range with Germany, which is larger than the overlap with Japan. It seemingly justifies *Made in China 2025* policy of Chinese government.

2-b) However, consideration of price heterogeneity gives different results. First, similarity between Japan and Korea has been lower than other pairs. The similar pattern observed that between Japan and Germany.

Those results suggest that those countries share similar export structures and have very different price structures. In case of China, the prominent catch-up much dampened when heterogeneity comes to the index.

Main contribution of this chapter is the theoretic development. Explicit introduction of the Minkowski parameter and the additional consideration of quality heterogeneity can be considered as theoretic contributions since it includes the effectiveness of the new index.

4. China's Processing Trade

Processing trade in China has been prevalent, despite rapid economic growth and consequent structural changes. China has achieved a significantly higher level of sophistication compared to

other developing economies with the help of processing trade. Despite of the facilitative effect and the contribution to trade stability there is another strand of literature insisting on the inefficiency of processing trade compared with ordinary trade.

There has been less interest in the external effects of processing trade. Literature emphasizing the low profitability of processing trade often ignores knowledge transfer from foreign enterprises and the positive externalities of processing trade. There has been less attention to the factors of processing export productivity.

Thus, the objective of this chapter is to analyze the effect of China's processing trade on China's export development. Specifically, there are two research questions.

1) **Theoretically, does processing trade policy help to improve productivity?**
2) **Empirically, what China has learned from processing trade?**

As for the first question, I made a theoretic development modifying cost-discovery model of Hausman et al. (2007). In the modified setting, entrepreneurs can achieve higher level of productivity on average by using processing trade.

As for the second question, experience of processing exports has facilitated the productivity catch-up of ordinary exports. For proving this, a hypothesis is set and evidence is suggested empirically.

This study examines the role of the processing trade, especially as it relates to exports productivity and export variety. The new model predicts that high productivity of processing exports, which can be characterized by leverage and coverage, may enhance the productivity of the sector. An empirical analysis gives firm support to the model. It also shows a learning effect of processing exports to the productivity of ordinary exports.

5. Concluding Remarks

China, Japan, and Korea implemented export-led economic development strategies in different times. Thus, analyzing export structure gives insight for evaluating the result of economic development strategies. The results of the thesis give policy evaluations of the three countries.

First, the export structure of China can be characterized by following observations.

1) High level of export diversification
2) Low diversification of export items for high-income countries
3) High export dependency on processing trade

In case of Japan, it can be characterized by high concentration on major varieties and markets and high structural stability.

In case of Korea, it can be characterized by two observations.

1) Low product and partner diversification
2) Poor exports survival ratio.

Conclusion: Policy implications for Korea

Low export product diversification is inevitable for Korea. Small economies tend to intensify the competitiveness of their main industry to reduce the risk due to the lack of diversity. However, for Korea, still it is hard to rebalancing industrial structure since each sector substantially contributes to the economy, especially to the employment side. Thus, this problem cannot be solved without strengthening service sector.

To maintain comparative advantage in manufacturing sector, diversification of existing products is needed. High dependency of the mid-stream firms should be relieved. Both demand and supply firms need to diversify their trade portfolios to activate production ecosystem.

The low survival rate of export is related with the low diversity of export. Exports are concentrated on major corporations and items, and exports of the others are poor in survival rate and share. However, Korea's SME export policy is considered to be comprehensive and effective. Thus, the low export survival rate can be understood as a result of the low competitiveness of SMEs. In order to solve this problem, it is necessary to establish a culture that encourages start-up of productive entrepreneurs.

On the other hand, regional diversification of exports is considered to be a somewhat feasible policy goal. The results of the utilization ratio analysis indicate that Korea still has potential new export ties.

Limitations and Future Research Plan

In Chapter 2, only annual data were used and using more frequent data can enhance the reliability of the result. Especially for the survival analysis, using annual data may rule out short breaks. Thus, future research should tackle this limitation by using different dataset.

As for Chapter 3, finding appropriate level of the parameter is leaved as a future research topic. Inversely, it is a limitation of this thesis. Research on the economical meaning of Minkowski distance which relates the economic understanding of L_p space should be added as a future research too. Mathematical property, such as axiomatic approach, of similarity indexes are still not given and will be worthy if one finds.

Recently, some Chinese scholars research with micro level dataset which generated by matching micro trade data and firm activity data. However, in Chapter 4, due to data availability, only China customs data was used. Using more detailed data will guarantee the reliability of analysis. Also, due to the length of data, Allerano-Bond estimation is used and but showed a less powerful result. Using more historically accumulated data or introducing other appropriate control variables or instrumental variables may enhance the regression results. Automatically those works are leaved for future research.