Thesis Title

Essays on Machinery Production Networks in East Asia

Thesis Summary

This dissertation focuses on the development, application, and extension of international production networks, mainly in East Asian countries. Using the most disaggregated product level data, this dissertation examines differences in product characteristics and attributes between parts and components and final products in machinery industries that play a central role in production networks. In addition to investigating of the resilience of international production networks, this dissertation further integrates trade data and tariff rates data to examine the impact of tariff rates in international production networks from various angles.

Chapter I is titled “Outline of the dissertation” and provides a concise summary of the content of each subsequent chapter. In this chapter, the brief background of international production networks and the over-time development of the machinery trade in East Asia have been provided. Chapter II, titled “Literature Review and Data Description,” reviews a large number of previous studies, both theoretical and empirical ones; examines, in depth, developments in the fragmentation theory; and discusses whether there is still room for further investigation in the literature. In addition, the chapter reviews trade statistics and tariff data to explore the export and import performance for parts and components and final products in terms of intra– and inter–regional trade, as well as the magnitude of tariff rates for East Asian countries.

Subsequently, this dissertation starts to extend a series of empirical studies in the next four chapters with a particular emphasis on East Asian countries. Chapter III is titled “Did international production/distribution networks mitigate the effect of the global financial crisis? Evidence from Taiwan machinery industry,” which investigates how Taiwan’s exports recovered after the global financial crisis in 2008-2009 through international production networks by using the survival analysis, particularly the trade relationship in exports with trading partners. This chapter provides the evidence that trade with East Asian countries presents a stronger resilience in the trade relationships. These positive effects are particularly strong in the parts and components of electric machinery.

The survival analysis in international production networks is further applied to investigate the impact of tariff rates on the import trade relationship. Tariffs are common trade barriers in the world, but we do not know much about the relationship between tariff rates and the resilience of international production networks. Chapter IV, which is titled “Impact of tariff rates on the probability of trade relationship survival: evidence from ASEAN+6 manufactured goods,” finds that products with low tariff rates are longer lived in international trade than products with high tariff rates. The lower the tariff rates, the longer the import trade relationships.
The next chapter also employs tariff rate data but examines whether the importers of East Asian countries exhibit tariff evasion behavior. The question is addressed in Chapter V, titled, “Tariff Evasion in Machinery Production Networks: Evidence from East Asia.” This chapter shows that imports by low-income East Asian countries are more likely to evade tariffs. Moreover, we find that the tariff evasion in parts and components trade increases much more than that in final products with a one-percentage-point increase in the tariff rate.

The final chapter is Chapter VI, titled, “Does Asian fragmentation matter for the extensive margin of international trade in machinery production networks?” In this chapter, we investigate the extent and depth of participation in international production networks. Specially, we examine whether parts and components are more likely to export than final products in 2013 by using probit model. Our probit estimate shows a 14.3% higher probability of exporting parts and components than exporting final products in 2013. Furthermore, we investigate the characteristics of product–country pairs and find that parts and components have a higher probability of setting up new product–country pairs and a lower probability of losing product–country pairs, compared with final products.

In addition to the conclusion and finding for each empirical chapter, those chapters also provided the meaningful implications that present the solution, suggestion, and comments for policymakers.