早稲田大学大学院アジア太平洋研究科

# 博士論文審査報告書

## 論 文 題 目

| 原題名<br>Original Title | Essays on Exchange Rates and International Trade<br>: Firms, Products, and Value-added Trade |
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| 英訳<br>In Japanese | 為替と国際貿易に関する研究<br>—企業、商品と付加価値貿易— |

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## 1. Absract of the Dissertation

The fxed exchange rate system, which was in effect under the Bretton Woods system in the post WWII period, collapsed in the early 1970s and it was replaced by a flexible exchange rate system in 1973. Since then, countries have chosen their own exchange rate systems. Some adopted more or less pure flexible system, under which the exchange rates of the currencies move flexibly reflecting demand and supply of the currencies, while some countries adopted pegged exchange rate system by fixing the value of their currencies to a certain currency such as the US dollar. Under these circumstances, trading environment becomes subject to increased uncertainty. Against this backdrop, this dissertation attempts to examine the relationship between exchange rate movements and international trade. An analysis is conducted from three different perspectives, namely, firms, products and value-added trade. Specifically, the following three questions are examined in three chapters. First, are firms in selected ASEAN countries immune from currency appreciation, and, how firms with different characteristics respond to a steady currency appreciation? Second, how does the value of Chinese Renminbi against US Dollar affect Chinese exports at a highly disaggregate product level, and is China's rise a fear to the region? Third, how does bilateral exchange rate volatility affect value-added trade in comparison with gross trade? The dissertation undertakes a rigorous quantitative approach by applying up-to-date econometric methods to detailed statistical data. In addition to reporting and discussing the empirical results, the dissertation provides useful inputs to policy discussions.

## 2. Outline of the Dissertation and Summary of the Chapters

The chapter outline of the dissertation is as follows.

Chapter 1. Introduction
Chapter 2. Exchange Rates and Firm Heterogeneity in Exporting: An Empirical Evidence
     from ASEAN
Chapter 3. Exchange Rate, Chinese Exports, and Competition in Asia: Empirical Evidence
     Using Product-level Data
Chapter 4. Exchange Rate Volatility, Value-added Trade, and Intra-regional trade in East
     Asia
Chapter 5: Conclusions


Chapter 1 presents the background and objectives of the study. The chapter also provides a brief survey of the theoretical literature on the relationship between exchange rate changes and trade. After reviewing the literature by focusing on the important issues and emerging trends on the exchange rate-trade relationship including risk, firm behavior, financial aspects, firm heterogeneity and others, the author concludes that theories do not offer a conclusive view on the impact of exchange rate movements on trade. The direction can be either positive or negative, depending on the assumptions built in the model. These observations justify the author to undertake empirical analysis on the relationship between exchange rates and trade.

Chapter 2 examines firms' heterogeneous responses to currency appreciation in four

ASEAN countries. Many firms in Southeast Asia see the rising labor cost in China as an opportunity to increase their exports, while the appreciation of their currencies is not in their favor. Aggregated trade data show that the region's exports have a steady growth despite appreciation of their currencies. This macro-picture is not consistent with what theories predict and thus might confuse the governments in designing export policies. In light of these observations, this chapter undertakes an econometric analysis on the impacts of exchange rate changes on exports by using firm-level data. The result suggests that firms in the sample actually were discouraged to export by currency appreciation, and they respond differently in terms of magnitude depending on the size, ownership structure and export status of the firms. Specifically, the following results are obtained. While SMEs and first exporters are more fragile to exchange rate movements, exporters can mitigate exchange rate risks through a foreign and domestic affiliation. Foreign owners are much more helpful. Firms whose exports consist of foreign inputs are less affected by the rise of local currency. Firms in the service sector are more sensitive to currency appreciation than manufacturers.

Chapter 3 examines the relationship between USD/RMB exchange rate and Chinese exports to the US and the dynamics of Chinese exports in connection to its neighbors from 1989 to 2015 using HS-10-digit commodity data. The analysis obtains the following results. First, RMB appreciation discourages Chinese exports to the US. The effect is more pronounced at a product-level than at an aggregated-level. Second, the impact is heterogeneous by sector, time period, and product category: capital-intensive industries and differentiated goods are more sensitive to the changes in exchange rate, while exchange rate effects increased after China's WTO accession and during the 2008 Global Financial Crisis. Third, China is competing with almost all Asian countries in the US market, but it cooperates with some Asian countries in certain sectors through the global production network. Fourth, although exchange rates affect Chinese exports, US demand is by far the most important determinant.

Chapter 4 re-examines the relationship between exchange rate volatility and trade using new value-added bilateral trade data for 41 countries during 1995~2013 in comparison with the gross trade data. Value-added export is what really matters to an economy in terms of job creation and value generation. Traditional approach using gross trade data to measure and study trade faces more challenges and criticisms due to "double counting" and multi-country production chains and some evidences indicate that the rise of Global Value Chains (GVCs) and Global Production Networks (GPNs) has weakened the link between exchange rate and trade. The literature presents no consensus on the relationship between exchange rate volatility and gross trade, and it also lacks empirical studies on its impact on value-added trade. The empirical results provide several findings as follows: first, exchange rate volatility discourages trade in general, but more seriously for value-added trade. Second, trade costs caused by geographical distance, common language and border effects between two countries became less important in value-added trade. Third, the empirical results of real and nominal exchange rates on trade are found to be similar in value-added trades to that in gross trade, and firms are found not to respond to the volatility of previous year in making

export decisions for the current year. Fourth, developed countries face less exchange rate risks. Fifth, intra-regional trade is less responsive to exchange rate volatility than inter-regional trade in East Asia and NAFTA, especially in NAFTA.

Chapter 5 summarizes the results of the analysis and then provides several implications for formulating trade policies. The first and foremost finding is that exchange rate and its volatility have significant impacts on foreign trade. This finding is supported by the analyses conducted by adopting various approaches and data including firm-level and product-level data. In addition, the importance of the effect of exchange rate on trade is found by an analysis using newly developed data on trade in value added. Indeed, the impacts are found to be greater compared to the analysis using traditional gross trade data. The author argues that China may deal with the negative impacts of US imposition of import tariffs on Chinese exports by devaluating RMB, although it may not be effective if the US demand declines. The author further points out that the currency devaluation may not be good policy because it may have repercussions in the capital market.

## 3. Discussions of Oral Defense Examination

The examination committee conducted the oral defense examination on December 14, 2018 after carefully reading the dissertation. The examination lasted approximately two hours.

A number of specific questions were raised on the contents of the dissertation. Without providing detailed accounts of the disscuions, the discuisons may be summaried as follows. There are too many tables in the main text. Only important tables should be included in the main text and less important tables should be included in the appendix. A number of empirical exercises have been conducted without sufficient discussions on the theroretical models/frameworks. There are many cases where insufficient discussions are given on the results of statistical exercise. For example, in Table 2.17, where an interaction of exchangte rates and foreign inputs is analyzed, the author finds that foreign inputs are less responsive to exchange rate movements compared to domestic inputs. This is an interesting finding but the discuisons on possible reasons behind this relationship are not explored sufficiently. The analysis of the effects of interaction terms show interesting results in many cases, but there exist even more cases where such relationship should be examined. For example, in the estimation of the impacts of exchange rate and its volatility on exports, an interaction term is introduced only for SME, but interaction terms with other variables such as foreign ownership should be tried. The definition or measurement of exchange volatility, which is one of the most important variables in the dissertation, varies depending on the chapters. This kind of treatment of the important variable casts doubt about the quality of the analysis. Somewhat related to this point, although the dissertaition consists of more or less independent essays, not only the contents but also the format of the dissertation should be consistent throughout the dissertation. On specific points, the analysis assumes 100% pass-through regarding the impacts of exchange rate changes on traded prices, however, such assumption may not be realistic in many cases. This point should be discussed in more detail. An analysis is conducted on indirect export in Chapter 2. This is an interesting attempt, but the accuracy of the data is questionable. As such, it is advisable to consider direct exports first, and then turn to indirect exports partly as a roubustness check.

## 4. **Evaluation and the Result of Examination**

The examiners find that this dissertation makes a number of important and interesting contributions to the research of the relationship between exchange rate and international trade by conducting a rigorous analysis by applying the up-to-date econometric methodologies to firm-level, product-level, and trade in value added data.

Considering the results of careful assessment of the submitted dissertation, whose summary is presented in sections 1 and 2 of this report, the oral presentation of the dissertation, subsequent discussions and revisions made to the dissertation, the committee members came to a unanimous decision that Yizhe Xie, the author of the submitted dissertation, should be granted a Ph.D.

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