ASEAN4 and China- Export Platforms for Japanese Affiliates?

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Abstract—Bayesian analysis is used to perform the probability estimation to examine the Japanese affiliates’ market penetration by exporting from ASEAN4 (i.e. Indonesia, Malaysia, Philippines and Thailand) and China. The estimation is conducted for 13 manufacturing sub-sectors in 2001-2005 and 2006-2010. This study found that Japanese affiliates not only benefited from low cost production and low trade barriers but also seized the advantage of internalized global production network within ASEAN4 and China to export their goods. Production networking could have both favorable and adverse effects on exports of Japanese affiliates.

Index Terms—Bayesian, exports, fragmentation, foreign direct investment, outsourcing.

I. INTRODUCTION

Japan has deeply committed herself to ASEAN4 (i.e. Indonesia, Malaysia, Philippines and Thailand) and China in foreign direct investment (FDI), trade and economic cooperation. The statistics from the Ministry of Economy, Trade and Industry (METI) reported that the amount of Japanese affiliates’ acquisition of tangible assets (excluding land) has grown from 330 billion yen in 2001 to 440 billion yen in 2005 and to 494 billion yen in 2010 for ASEAN4. However, this amount has increased by 1.28% from 2001 to 2005 and amounted to 425 billion yen in 2010 for China. The share of exports sales to total sales of Japanese affiliates in ASEAN4 and China for manufacturing industry has decreased from 36.5% in 2001 to 28.37% in 2010 for ASEAN4, and from 30.87% in 2001 to 14.70% in 2010 for China.

The rise of China has attracted Japanese affiliates to shift their production base from ASEAN4 to China. This led to the purpose of this study, which is the analysis of manufacturing exports of Japanese affiliates in ASEAN4 and China from 2001 to 2010. Ultimately, this study examines the international market penetration of Japanese affiliates using ASEAN4 and China as export platforms. This paper performs the probabilistic estimations based on a modified ratio of export sales to investment for 13 manufacturing sub-sectors using Bayesian analysis. The estimation incorporates the effects of unobserved factors on exports and can be used to gauge the Japanese affiliates’ degree of international market penetration by exporting from ASEAN4 and China to the rest of the world (except Japan) and shed some light on Japanese production networks. The diagnostic results in the form of probability values can be used directly for short-term planning and decision making.

Section II presents the conceptual framework and methodology. Section III provides the evaluation framework based on the estimated probability. Results are discussed in Section IV followed by concluding remarks in Section V.

II. CONCEPTUAL FRAMEWORK AND METHODOLOGY

Due to the lack of disaggregated data, it is not feasible to employ regression models for this study. Therefore, this study performs a probabilistic estimation based on the modified ratio of exports to investment. As the share of investment varies across sub-sectors, it is important to normalize the ratio of exports to investments as follows:

$$r_j = \frac{\alpha_j}{\alpha_j / (X_j)}$$

where $r_j$ is the ratio of Japanese affiliates’ exports on investment for the respective manufacturing sub-sector to Japanese affiliates’ total exports on investment of manufacturing industry. $r_j$ exceeding unity indicates positive induced increment resulting from the initial investment, positive direction of acceleration effects and low substitution for exported goods, and vice versa.

The Bayes theorem of joint probability distribution for the Japanese affiliates’ export for each industry is expressed as follows:

$$p(x_j | r_j, e) = \frac{p(r_j | x_j, e) p(x_j, e)}{p(r_j, e)}$$

(2)

The $p(x_j | r_j, e)$ denotes the posterior probability of $x_j$ resulted from $r_j$ given unobserved $e$. The $p(r_j | x_j, e)$ denotes the likelihood of $r_j$ given the true value of $x_j$ and $e$; $p(x_j, e)$ denotes the prior probability of $x_j$ given $e$ which accommodate for the effects of unobserved parameters; $p(r_j, e)$ denotes the expected evidence of $r_j$ given $e$. This study estimates Eq. (2) for the above average exports given $r_j$ is greater than unity. Then, the Markov Chain Monte Carlo (MCMC) has been utilized to generate simulated observations from the posterior distribution of the unknown quantities for Eq. (2).

Japanese FDI is commonly in the form of mergers and