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Vertical trade and free trade agreements

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ABSTRACT

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We investigate the effects of free trade agreements (FTAs) on tariffs and welfare in vertical trade. We consider a three-country model, where an FTA is formed between a country exporting a final good and a country exporting an intermediate good. The FTA unambiguously leads to a reduction in the member country's tariff, but may cause the non-member country's tariff level to increase. In the case, where FTA raises the non-member country's tariff level, the FTA increases that country's welfare. In contrast, the FTA may render its member countries better off. This result implies that the formation of an FTA may not always be Pareto-improving. *J. Japanese Int. Economies* **24** (4) (2010) 569–585. Graduate School of Economics, Nagoya City University, 1 Yamanohata, Mizuho-cho, Mizuho-ku, Nagoya 467-8501, Japan; Graduate School of International Cultural Studies, Tohoku University, Japan; Faculty of Economics, Tohoku Gakuin University, Japan.

1. Introduction

Recently, the number of free trade agreements (FTAs) has been rapidly increasing across the world. According to Ministry of Economy, Trade and Industry (METI), Japan (2008), while there were 46 FTAs worldwide in 1990, the number increased to 194 in 2007. In particular, countries in Asia, the Middle East, and Africa, which previously lacked FTAs, are now accelerating the formation of FTAs.

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With an increase in their number, FTAs have become an important topic in international trade theory. One research stream on FTAs clarifies their effects on welfare (*e.g.*, Kose and Riezman, 2000; Yi, 2000; Bond et al., 2004), and another focuses on multilateralism and FTA (*e.g.*, Krishna, 1998; Freund, 2000; Ornelas, 2005; Saggi, 2006).

The above studies on FTA address horizontal trade, *i.e.*, international trade in which countries mutually export final goods. However, vertical trade, *i.e.*, international trade in which one country exports intermediate goods to other countries that process the imported inputs into final goods for their exports, has gained significance in recent trade transactions. Such vertical trade structures are particularly notable in the Asian region. For example, Japan exports components such as semiconductors for computers to other Asian countries such as China, and imports computers mainly from China (JETRO, 2006). Further investigations are required to consider vertical trade structures.

The purpose of this paper is to clarify how FTAs affect tariff rates and, in turn, welfare levels in the context of a vertical trade structure. We construct a simple three-country model, in which one "upstream" country exports an intermediate good to two other "downstream" countries and imports a final good from both of them. Before the FTA, the government in each country determines its tariff level in a noncooperative fashion. We then consider an FTA between the upstream country and one of the downstream countries. The other downstream country is regarded as a non-member country. Thus, tariffs between the FTA member countries are eliminated, while an external tariff of the upstream country and the tariff of the non-member downstream country are still endogenously determined. In this setting, we investigate how the FTA affects each country's tariff levels and, in turn, its welfare.

In our model, which considers Cournot competition with linear demands and constant marginal costs, each country's optimal tariff is influenced by the other countries' tariffs. This finding is in contrast to those of previous studies, including Freund (2000), Ornelas (2005), and Saggi (2006), which adopt a similar assumption in the analysis of FTAs with horizontal trade structures. In these studies, it is shown that the formation of an FTA induces its member countries to reduce their external tariffs, but the FTA does not affect the non-member country's tariff. Thus, these studies do not completely illustrate the strategic relationship between FTA member and non-member. We propose an alternative framework, apart from the existing horizontal trade models, to describe the strategic relationship between member and non-member countries.

We obtained the following results with regard to the FTA's tariff effects. The formation of the FTA unambiguously induces its member country to reduce the tariff for the non-member country. This external tariff after the FTA may be negative (*i.e.*, an import subsidy). In contrast, while the non-member country may or may not raise its tariff level, it certainly imposes a positive tariff after the FTA. In most cases, the FTA induces the non-member country to raise its tariff.

With regard to the effect of the FTA on each country's welfare, the following results are obtained. For the non-member country, raising the tariff after the FTA leads to an increase in its welfare. As regards the FTA members, the downstream country is better off after the FTA as long as its FTA partner (*i.e.*, the upstream country) imposes a positive external tariff after the FTA. However, it may be worse off if the external tariff imposed by the FTA partner is negative. In contrast, the FTA may or may not make the upstream member better off. In addition, some numerical analyses indicate that the FTA may increase the members' joint welfare as well as world welfare.

As mentioned above, this paper focuses on tariff and welfare effects of FTAs; therefore, it is related to FTA studies for the most part. However, studies on vertical trade policies are also an important reference for this study (*e.g.*, Bernhorfen, 1997; Ishikawa and Spencer, 1999; Chang and Sugeta, 2004; Yanase and Kawabata, 2008). In fact, this paper is structured on the basis of the literature on vertical trade policies. Thus, our study links these two research streams and provides a new insight into FTA studies.

The rest of this paper is organized as follows. Section 2 presents the basic model. Section 3 derives the equilibrium and examines pre-FTA tariffs. Section 4 considers the effects of the FTA on the member country's external tariff and the non-member country's tariff levels. Section 5 analyzes the effects of the FTA on welfare. Section 6 concludes the paper.