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Do Free Trade Agreements Increase Economic Growth of the Member Countries?

JUNG HUR
Sogang University, Seoul, Republic of Korea

and

CHEOLBEOM PARK *
Korea University, Seoul, Republic of Korea

Summary. — This paper assesses whether a bilateral FTA raises the growth rates of the two countries engaging in the FTA. A nonparametric matching approach, which imposes no specific functional forms and can be applied to a broad range of data structures, is employed to estimate the FTA effect on the growth. We find that FTAs exert insignificant effects on aggregated growth from one to 10 year period after launch, but detect a significant upward trend in the gap between the growth rates of per capita GDP within a bilateral FTA. This implies uneven FTA effects across countries within an FTA.

Key words — convergence, divergence, free trade agreement, growth, matching, treatment effect

1. INTRODUCTION

The number of bilateral free trade agreements (FTA hereafter) has risen rapidly since the early 1990s, as is shown in Figure 1. [1] There could be many reasons why countries enter into such agreements, but one of them must be increases in economic growth as the result of trade promotions from the FTAs since policy makers and economists regard FTAs as important policy tools for economic development. International trade theories, from Ricardo's comparative advantage model through the two-country endogenous growth models developed by Grossman and Helpman (1991) and Feenstra (1996), can be considered rationales for the formation of FTAs.

However, although most international trade theories compare economic agents' welfare prior to and after the free trade agreement via two-country models, the mutual effect of free trade on two countries engaged in a bilateral FTA has yet to be empirically investigated with sufficient rigor. Existing empirical studies have generally examined the correlation between an individual country's growth and the degree of openness of that country, whereas the effect of FTA can be examined by investigating whether both countries will be better/worse off once they have removed all their trade barriers and implemented a free trade system than they would be without the free trade system. In addition to the absence of studies on the FTA effect on two countries' growth performance, no consensus has yet been reached regarding the effects of free trade or openness on one country's economic growth among empirical studies. Whereas Dollar (1992), Sachs and Warner (1995), Edwards (1998), Frankel and Romer (1999), and Dollar and Kraay (2004) reported supportive evidence for a positive impact of free trade on economic growth by using a variety of measures of openness, Harrison (1996), Rodriguez and Rodrik (2000), Rodrik, Subramanian, and Trebbi (2004), and Wacziarg and Welch (2008) found that free trade had a negative or insignificant effect on economic growth. Recent contributions to the literature on empirical growth provide some examples of nonlinear specifications. The studies of Freund and Bolaky (2008) and Chang, Kaltani, and Loayza (2009) show that the growth effect of trade openness is significantly positive only if certain complementary domestic reforms are undertaken, including deregulations of business, financial developments, better education or rule of law, labor market flexibility, etc. Otherwise, trade is not associated with long-run growth in such economies.

In this paper, we also attempt to characterize empirically the effects of free trade on economic growth; however, our approach differs from those applied in previous studies in two important ways. First, the existing empirical literature relates an individual country's growth to the degree of openness of that country, and trade openness is frequently constructed as an index reflective of the trade liberalization regimes or policies of *that individual* country. However, the concept of openness is rather difficult to define, and the indices are generally highly correlated with other economic variables of that country, which makes it difficult to interpret results on the basis of trade theories (see Rodriguez & Rodrik, 2000). In addition to these issues, countries with the same levels of openness may experience different effects of that openness in terms of their economic growth, depending on the level of openness of their respective principal trade partners. In our paper, we focus on bilateral FTA systems among a variety of relevant trade

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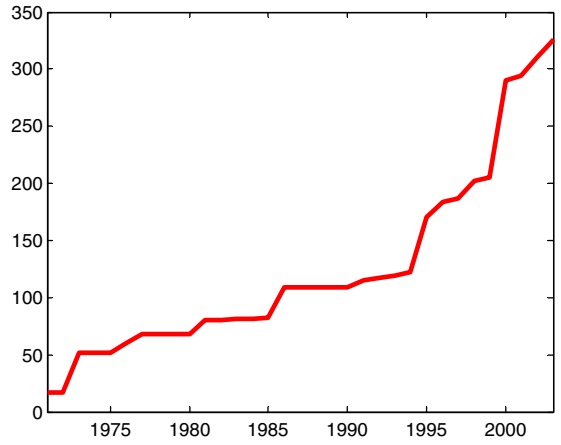

Figure 1. *Cumulative number of FTAs. Notes: The data source is WTO's report of Regional Trade Agreements Notified to the GATT/WTO by Date of Entry into Force for the 1958–2003 period. This figure shows the cumulative number of a bilateral FTA, which is counted as one if a couple of countries engages in a free trade system such as a free trade agreement or customs union.*

policies to reduce mutual trade barriers and stimulate trade volume (e.g., Baier & Bergstrand, 2007). Because a bilateral FTA is formed by a pair of countries, it can be considered an indicator of "mutual openness" for the countries specifically involved in the agreement. The bilateral effects of free trade can be identified more directly in the context of mutual openness rather than from the perspective of individual country's trade openness. In analyzing these effects, we utilize a binary dummy variable to indicate whether or not a country couple has an FTA, and then consider the growth rates of both economies engaged in the FTA.[2] Although we do not deny the utility of the unilateral trade openness measures utilized in the existing literature and think that nontariff barriers could still exist within an FTA couple, we believe that the exercise to examine the FTA effect on two countries' growth performance is worthwhile in the face of the rising trend of FTAs.[3]

Second, we consider engagement in an FTA as a "treatment" in the terminology of matching literature, and propose a nonparametric matching approach to evaluate the effects of FTAs on growth. The question addressed by the nonparametric matching approach is what would be the difference in the economic growth of a country couple when this couple has an FTA, as compared with the case in which this couple does not have an FTA. We believe that this question is more relevant in evaluating the effect of FTA than a simple comparison of the growth rates between countries with FTAs and countries without FTA, which is the question most often addressed by regression analyses. In fact, the majority of empirical studies, including the aforementioned ones, have adopted a parametric linear model using either cross-sectional or panel data. However, this linear regression approach not only has a conceptual problem in assessing the effects of free trade on the basis of trade models, but is also subject to econometric issues. We demonstrate herein that the linear regression approach is subject to misspecification problems due to potential nonlinear relations among variables, as well as the nonrandom selection problem. However, the nonparametric matching approach imposes no parametric restrictions, and has been demonstrated to perform well even in the face of the nonrandom selection problem. Although this approach is popular in the field of labor economics, economists in the trade literature have recently begun to use this econometric approach. Relevant examples include Chang and Lee (2011) and Baier and Bergstrand (2009). To the best of our knowledge, however, this approach has never been utilized in the literature on trade and growth.[4]

Our paper is organized as follows. In Section 2, we provide a brief description of the dataset used in this study. After demonstrating that an FTA exerts a significantly positive effect on economic growth under the usual linear regression, we present evidence suggesting that this linear regression model suffers from nonrandom selection and misspecification problems. Section 3 briefly discusses the econometric methodology used in this study—namely, the nonparametric matching approach. In Section 4, our main findings are presented via nonparametric matching analysis. While we find that FTAs exert no statistically significant effects on aggregated economic growth from one to 10 years period after launch, we report an upward trend in the gap between the growth rates in per capita GDP among countries participating in an FTA. This finding implies that some countries may enjoy a positive FTA effect on economic growth, while their counterparts in the FTA experience a negative FTA effect on economic growth. This finding may explain, in part, the observed insignificant or mixed effects of trade openness on economic growth of countries. Section 5 presents our concluding remarks.

2. DATA AND THE LINEAR REGRESSION APPROACH

We describe the dataset in this section and provide evidence of econometric problems occurring in linear regressions even if the trade openness index is replaced with the FTA dummy variable.

(a) *Dependent variable or response variable*

In order to estimate the effects of FTAs on the growth performance of a country couple engaging in an FTA, we utilize the growth rate of the real gross domestic product (GDP) per person of a country couple for the dependent variable in the regression analysis, or for the response variable in the matching analysis. The per capita GDP for a couple composed of Country A and Country B is constructed as follows:

$$\frac{GDP_A + GDP_B}{Population_A + Population_B} = w_A \frac{GDP_A}{Population_A} + w_B \frac{GDP_B}{Population_B},$$

where $w_A \frac{Population_A}{Population_A + Population_B}$ and $w_B \frac{Population_B}{Population_A + Population_B}$.

Assuming that this variable is a proxy measure of a representative agent's welfare in two countries engaged in an FTA, we compare the growth rates of this variable[5] before and after FTAs, as theories in international trade usually compare a representative agent's welfare before and after free trade via a two-country setting.

(b) *Control variables or covariates*

As we wished to estimate the treatment effect of a bilateral FTA via the nonparametric matching approach, we required covariates that render a treated couple (countries engaged in a bilateral FTA) and an untreated couple comparable in terms of their potential growth performance and the likelihood of their forming a bilateral FTA. Similarly, we also required variables to control factors that may affect the growth performance and the possibility of forming a bilateral FTA in the regression analysis. Among many variables that have been re-