Do free trade agreements actually increase members' international trade?

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Abstract

For over 40 years, the gravity equation has been a workhorse for cross-country empirical analyses of international trade flows and — in particular — the effects of free trade agreements (FTAs) on trade flows. However, the gravity equation is subject to the same econometric critique as earlier cross-industry studies of U.S. tariff and nontariff barriers and U.S. multilateral imports: trade policy is *not* an exogenous variable. We address econometrically the endogeneity of FTAs. Although instrumental-variable and control-function approaches do not adjust for endogeneity well, a panel approach does. Accounting econometrically for the FTA variable's endogeneity yields striking empirical results: the effect of FTAs on trade flows is quintupled. We find that, on average, an FTA approximately *doubles* two members' bilateral trade after 10 years.
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1. Introduction

> The issue of exogeneity may also be an important problem when dummy variables are used (in a gravity equation) to estimate the effects of free trade areas (Lawrence, 1998, p. 59).

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One might expect — having witnessed a virtual explosion in the number of free trade agreements (FTAs) among nations over the past decade and a half — that the answer to the question posed in this paper's title is unequivocal: *yes*! Surprisingly, international trade economists can actually claim little firm empirical support for reliable quantitative estimates of the average effect of an FTA on bilateral trade (all else constant).

Over the past 40 years, the "gravity equation" has emerged as the empirical workhorse in international trade to study the ex post effects of FTAs and customs unions on bilateral merchandise trade flows.[1] The gravity equation is typically used to explain cross-sectional variation in country pairs' trade flows in terms of the countries' incomes, bilateral distance, and dummy variables for common languages, for common land borders, and for the presence or absence of an FTA. Nobel laureate Jan Tinbergen (1962) was the first to publish an econometric study using the gravity equation for international trade flows, which included evaluating the effect of FTA dummy variables on trade. His results suggested economically insignificant "average treatment effects" of FTAs on trade flows. Tinbergen found that membership in the British Commonwealth (Benelux FTA) was associated with only 5 (4) percent higher trade flows. Since then, results have been mixed, at best. For example, Aitken (1973), Abrams (1980), and Brada and Mendez (1985) found the European Community (EC) to have an economically and statistically significant effect on trade flows among members, whereas Bergstrand (1985) and Frankel, Stein and Wei (1995) found insignificant effects. Frankel (1997) found positive significant effects from Mersosur, insignificant effects from the Andean Pact, and significant *negative* effects from membership in the EC in certain years. He noted:

> If the data from four years — 1970, 1980, 1990, 1992 — are pooled together, the estimated coefficient on the European Community is a smaller 0.15, implying a 16 percent effect" (p. 83).

Frankel (1997) concluded that several readers "have found surprising our result that intra-European trade can be mostly explained by various natural factors, with little role for the EC until the 1980s…." (p. 88). Other studies in international trade have had similar seemingly implausible results.[2]

The fragility of estimated FTA treatment effects is addressed directly in Ghosh and Yamarik (2004). These authors use extreme-bounds analysis to test the robustness of FTA dummy coefficient estimates. They find empirical evidence using cross-section data that the estimated average treatment effects of most FTAs are "fragile," supporting our claims. Thus, there still are no reliable ex post estimates of the FTA average treatment effect. This paper is aimed at addressing this puzzle.

All these studies, however, typically assume an *exogenous* right-hand-side (RHS) dummy variable to represent the FTA treatment. In reality, FTA dummies are not exogenous random variables; rather, countries likely select endogenously into FTAs, perhaps for reasons unobservable to the econometrician and possibly correlated with the level of trade.[3] This paper applies developments in the econometric analysis of treatment effects — some well-known and others more recent — to estimate the effects of FTAs on bilateral trade flows using a panel of cross-

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[1] Bayoumi and Eichengreen (1997, p. 142) note that the gravity equation has "long been the workhorse for empirical studies of the pattern of trade." This study (purposefully) does not address ex ante analyses of the effects of FTAs on trade flows using computable general equilibrium models.

[2] Frankel (1997) and Oguledo and MacPhee (1994) provide summaries of FTA coefficient estimates across studies. Frankel (1997, pp. 86–90) draws considerable attention to the surprising insignificant effects (especially prior to the 1980s) of the EC and EFTA in his and others studies, such as Bergstrand (1985, 1989) and Boisso and Ferrantino (1997). However, no systematic explanation is provided.

[3] We note that, for about a decade, several researchers have acknowledged potential endogeneity bias, but only that created by GDPs as RHS variables. Several authors have instrumented for GDPs, but (with the exception of the three studies noted shortly) none have instrumented for FTAs.