New measures of trade creation and trade diversion ☆

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ABSTRACT

This paper estimates the effects of regional agreements on trade flows controlling for country pair, importer-year, and exporter-year fixed effects. These fixed effects capture the determinants of trade flows normally included in gravity model specifications and control for yearly shocks to countries' trade. Controlling for the fixed effects generally reduces the estimated trade impacts of regional agreements. The estimates reveal that regional agreements have significant anticipatory effects on trade flows and continue to affect trade for up to 11 years after they begin. The paper also presents estimated effects on individual countries' trade flows in year five of the agreements.

1. Introduction

Since Jacob Viner (1950) described how the welfare effects of a regional trade agreement (RTA) depended on the trade creation and trade diversion generated, economists have been interested in estimating these two effects. Empirical work estimating these effects is particularly important since theoretical work suggests that regional agreements may be beneficial or harmful depending on the particular countries involved and the extent of trade creation relative to trade diversion (see Panagariya, 2000 for a survey). As Burfisher et al. (2001, 139) put it, "whether or not a regional trade agreement benefits its members will depend on parameter values and initial economic structure — it is essentially an empirical issue that must be settled by data analysis."

Because of data limitations, most studies do not attempt to measure the welfare effects of regional agreements, but instead take the first step down that path by estimating the impacts of the agreements on trade flows. Existing studies estimate changes in trade patterns due to regionalism in two distinct ways. Ex post studies examine trade flows after the RTA has been implemented and compare the actual levels of trade with a prediction of trade in the absence of the RTA. Ex ante studies use trade patterns and estimated elasticities or computable general equilibrium models prior to the agreement to calculate the predicted effect of eliminating trade barriers with a partner country.

Both methods as currently implemented, however, are subject to criticism. As Panagariya (2000, 325) explains, "there are sufficiently serious problems with both empirical approaches that the results based on them are unlikely to change the minds on either side of the regionalism debate." Ex post studies must establish a counterfactual of trade that would have occurred in the absence of the agreement, but Clausing (2001, 679) comments that this exercise "has proved difficult." One common way of predicting trade flows in the absence of the RTA is by using the gravity model to predict bilateral trade based on the distance between countries, the size of their economies, and other variables such as whether the two countries speak the same language. The effects of the agreement on trade are then measured by RTA dummy variables.

There are a number of weaknesses inherent in such an approach, however. First, Wonnacott and Lutz (1989) and Krugman (1991) have proposed a "natural trading partner" hypothesis that countries will tend to form regional agreements if they already have significant bilateral trade, and that such agreements are likely to be trade creating. Magee (2003) uses a simultaneous equations model to show empirically that higher bilateral trade flows do increase the likelihood that countries will form free trade agreements. Thus, coefficients on RTA dummy variables are capturing more than just the effects of the agreement; they also incorporate the possibility that "high levels of intra-bloc trade may be due not to the formation of preferential trading arrangements but rather to historical or political relationships between bloc members" (Haveman and Hummels, 1998, p. 62). Soloaga and Winters (2001) make a similar argument. Bayoumi and Eichengreen (1995) attempt to deal with this criticism by estimating the gravity model in first differences so that unobserved country pair characteristics that are constant over time will drop out. This method will not control for time-varying omitted variables, however, as Haveman and Hummels (1998) point out.

Gravity model estimates of RTA effects are also sensitive to the sample of countries included in the analysis. Haveman and Hummels (1998, 52) show that changing the sample of countries results in a different prediction of trade in the absence of the RTA, and thus estimates of RTA effects "vary dramatically in their conclusions." Pomfret (1997, 254) also cites a number of "implausible results" in studies using the gravity model to measure the trade effects of RTAs and concludes that "there are clearly shortcomings" in this approach. More recently, Ghosh and Yamarik (2004) argue that the gravity model results are very sensitive to the variables included in the regressions and to the prior beliefs of the researchers. They find a dramatic drop in the number of regional agreements that are trade creating when they incorporate the researcher's prior beliefs into the estimation.

Ex ante studies of trade creation and diversion fall into two camps. Some studies, such as Karemera and Ojah (1998) estimate import demand elasticities within industries prior to the formation of a trade agreement. These elasticities are then used to project the effects of eliminating tariffs with a trading partner. Wylie (1995) criticizes this approach, however, as missing important general equilibrium impacts of trade agreements. As he argues (p. 81), "the tariff changes, substitution elasticities, and resulting macroeconomic stimulative effects themselves are probably of less potential importance in stimulating trade and growth than the reduced uncertainty" of the policy environment.[1] An alternative is to estimate computable general equilibrium models of trade, as Brown et al. (1992) have done. Clausing (2001) and Wylie (1995) both point out that CGE estimates are very sensitive to the assumptions and parameters built into the model, however. The net result is that "the empirical work has failed to reach firm conclusions on even the most basic issue regarding preferential trading agreements: whether trade creation outweighs trade diversion." (Clausing, 2001, 678)

This paper estimates the effect of regional agreements on trade flows after controlling for country pair, importer-year, and exporter-year fixed effects. This estimation technique is similar in principle to the ex post studies described above in that the method is to compare existing levels of trade under an RTA to a hypothesized counterfactual level of trade in the absence of the RTA. The predicted counterfactual used in this paper, however, eliminates many of the criticisms of gravity model studies. First, the estimation includes an importer->exporter fixed effect that controls for unobserved reasons why two countries may have historically had high levels of bilateral trade. Thus, the method adopted in this paper solves the problem that countries forming RTAs may have higher trade volumes even in the absence of the agreement. Year fixed effects for each importing and exporting country are also included to capture the effects of importer and exporter changes in output, income per capita, population, and other variables included in gravity model specifications. The fixed effects are more flexible, however, in that they also capture any aggregate shocks to the countries' trade flows in a given year. Controlling for aggregate shocks is particularly important since Krueger (1999) concludes that NAFTA did not have a large effect on trade in the first three years of its existence relative to the impacts of shocks such as the "tequila crisis" and cuts in Mexican nontariff barriers prior to NAFTA. Finally, the use of fixed effects eliminates the need to choose which variables to include as controls in the regression, and thus it alleviates the criticism of Ghosh and Yamarik (2004) that the researcher's prior beliefs are influencing the results presented. The models estimated in the paper also allow regional agreements to have different impacts on trade flows over time so that the dynamic effects of trade deals can be measured.

The new estimates in this paper reveal several interesting results. First, regional agreements have a clear anticipatory effect on trade flows — there is a significant increase in trade during the four years leading up to the beginning of the average RTA. The change in bilateral trade also continues to be influenced by the formation of a regional agreement for many years after its start — the estimates here find significant positive effects of RTAs on bilateral trade flows up to 11 years after the agreement begins. This dynamic analysis of regionalism is an advance over most previous measures of RTA trade effects, which have been primarily static cross-section estimates that do not consider the maturity of the trade deal. The paper also shows that the type of agreement signed changes both the overall trade effect and the time path of trade effects. On average, a customs union (CU) has long-lasting impacts on intra-bloc trade while a free trade agreement (FTA) has shorter and, in the long-run, smaller impacts on trade within the region. Preferential trading arrangements have the smallest effects on trade flows, and these effects do not begin until several years after the trading bloc forms. For countries joining a new regional agreement, intra-bloc trade effects amount to less than 3% of the country's total imports on average in year five of the trade deal. Estimates of the trade diverting effects of regional agreements are much smaller and are sensitive to the specification of the model. Finally, the paper uses predicted values from the regressions and actual trade flows to show separate measures of the effect of an agreement on each country's imports. The results indicate that the impacts on each country differ greatly even within a common regional agreement.

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[1] This argument is consistent with testimony at 1997 ITC hearings on NAFTA by executives who indicated that NAFTA's tariff reductions were less important than its investment guarantees and other provisions (U.S. International Trade Commission, 1997, page 2-29).