RECIPROCAL *VS* NONRECIPROCAL TRADE AGREEMENTS: WHICH HAVE BEEN BEST TO PROMOTE EXPORTS?

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Abstract

Over the last decades developed countries have provided preferential access to their markets to developing countries through nonreciprocal trade agreements. Moreover, developing countries have also participated in reciprocal trade agreements. This paper investigates comparatively for the first time the effect of both kinds of trade agreements on exports from developing countries but also from the developed world. We find that both agreements, but especially the reciprocal agreements, have boosted exports from beneficiary countries to developed countries. In the opposite direction the impact is similar in both cases.

Key words: Preferential trade agreements, Nonreciprocal preferential trade agreements, GATT/WTO, developing countries, exports, gravity equation.

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1. Introduction

One of the most important challenges in the Doha's round of trade negotiations is the promotion of development. The Doha Development Agenda recognizes the central role that international trade can play in the promotion of economic development. In fact, the increase of exports from developing countries to industrialized nations' markets has long been considered an essential element to reduce poverty, promote sustainable development and reap the potential benefits of globalization for the developing world. While there has been an intense debate in policy-making circles on how best to accomplish these aims, the traditional approach has implied that developed countries give support to the integration of developing countries into the world economy through a series of unilateral concessional measures towards developing countries in the form of nonreciprocal trade preferences. The leading instrument for this so-called "special and differential treatment" for developing countries has been the Generalized System of Preferences, but there exist other nonreciprocal preferential trade agreements (NRPTAs) that are part of this approach, such as the ACP-EC partnership agreement, the Caribbean Basin Initiative, the Andean Trade Preference Act, the African Growth and Opportunity Act or the Everything but Arms initiative.[1]

As is well known, trade arrangements for developing countries have not been confined to one-way trade preferences. On the one hand, a large number of developing countries are members of the GATT/WTO system, which is based on the reciprocity and the most-favored nation principles.[2] On the other hand, developing countries have also

[1] For about five decades, developing countries have asked for and received considerable preferential access to developed country markets on the basis that preferential tariff rates in developed country markets could promote export-driven industry growth in developing countries. The intellectual underpinnings for the "special and differential treatment" arrangements in GATT for developing countries go back to the 1950s. They were based on balance of payments problems for developing countries, protection on infant-industry grounds and the Singer-Prebisch thesis about the secular decline in developing countries terms of trade (Whalley, 1999).

[2] In fact, many developing countries are among the early joiners of the GATT. Cuba, Brazil, India, Myanmar, Pakistan, South Africa, Sri Lanka and Zimbabwe joined in 1948; Chile (1949); Dominican

made a conscious effort to forge reciprocal preferential trade agreements, involving only developing countries (known as South-South agreements) or implicating both developing and developed countries (known as North-South agreements). The Common Market of Eastern and Southern Africa (COMESA), the Association of Southeast Nations (ASEAN), and the *Mercado Común del Sur* (MERCOSUR) are examples of South-South agreements. In contrast, the North American Free Trade Agreement (NAFTA), the agreement between Canada and Chile and that between the European Union and Mexico are examples of North-South agreements.

Critics of nonreciprocal preference schemes argue that developing countries should abandon their reliance on one-way trade preferences in favor of reciprocal agreements, since the latter implies a stronger, credible and lasting commitment (see, for example, Whalley, 1990; Panagariya, 2002 y Özden y Reinhardt 2005). This approach is also advocated by those who believe that the infant-industry argument, often used to justify unilateral concessions, is a fallacious argument. However, hitherto, while the increase of exports is widely seen as key for development, it is not clear which type of agreement (reciprocal or not) has had a larger impact on bilateral export flows. The aim of this paper is to shed light on this issue.

The gravity equation has become the main econometric approach for examining *ex post* the "partial" (or direct) effects of economic integration agreements on aggregate bilateral trade flows. After accounting for endogeneity bias using panel data techniques, in an influential article Baier and Bergstrand (2007) find that free trade agreements do increase countries' bilateral trade flows significantly. Following this empirical strategy and the same data set, Behar and Cirera-i-Crivillé (2013) go a step further by comparing the impacts of North-South and South-South trade agreements on bilateral trade and show

Republic, Haiti, Indonesia, Nicaragua and Sweden (1950); Peru and Turkey (1951); Uruguay (1953); Barbados, Ghana and Malaysia (1957).

that free trade agreements lead to an increase in bilateral trade regardless of whether the signatories are developing or developed countries. In particular, they find that the percentage rise in bilateral trade is higher for South-South agreements that for North-South agreements. Moreover, two recent studies focus on investigating the impact of nonreciprocal trade agreements on bilateral trade. On the one hand, Gil-Pareja et al. (2014) provide an in-depth analysis on the issue finding, not surprisingly, robust evidence that NRPTAs positively affect developing countries' exports to developed countries. On the other hand, in a recent paper Gil-Pareja et al. (2016a) interestingly show that, despite the lack of reciprocity, this kind of agreements also have an economically significant effect on exports in the opposite direction, that is, from benefactor countries to beneficiary countries.[3]

This paper investigates comparatively the effect on exports from developing countries to developed countries of both reciprocal and nonreciprocal trade agreements. Moreover, in line with Gil et al. (2016a) results, we also examine the potential differential impact of both types of agreements on exports from developed countries to beneficiary countries.[4] To the best of our knowledge this is the first research addressing these issues. Econometrically, our paper accounts for multilateral resistance terms, unobserved bilateral heterogeneity, heteroskedastic residuals, and zero trade flows. So, our estimates

[3] Gil et al. (2016a) offer two possible explanations for why nonreciprocal agreements might have this reverse effect. One refers to the fact that criteria for designating eligible countries include benefactor countries commercial interest. The other refers to rules of origin to prevent trade deflection, since many developed countries allow beneficiary countries to count imports from them of intermediate products used in production as "originating" products.

[4] We focus on the partial (or direct) trade effects, nor the general equilibrium (or indirect) effects as in Anderson and van Wincoop (2003), Egger and Larch (2011), Egger et al. (2011) and Bergstrand, et al. (2013). Anderson and van Wincoop (2003) were the first to calculate the general equilibrium counterfactual effects of a removal of national borders, taking into account income changes. See Head and Mayer (2014) for a detailed discussion of the differences between "Partial Trade Impact" (PTI) and "General Equilibrium Trade Impact" (GETI). Computing the full general equilibrium (comparative-static) effect is beyond the scope of this paper. It is left for future research.

are obtained from a theoretically motivated gravity equation that accounts for the endogeneity of trade policies.[5]

To preview our results, we find that for exports from beneficiary countries to developed countries both reciprocal and nonreciprocal agreements have had a positive effect, and that the estimated coefficient is always larger for reciprocal than for nonreciprocal agreements, being the difference statistically significant in our preferred specification. In contrast, in the case of exports from developed countries to beneficiary countries the estimated coefficients are positive and very similar in magnitude for both reciprocal and nonreciprocal agreements.

The paper is structured as follows. Section 2 presents the methodology. Section 3 describes the data. Section 4 discusses the estimation results. Finally, section 5 concludes the paper.

2. Methodology

Since it was independently developed by Tinbergen (1962) and Pöyhönen (1963) more than five decades ago, the gravity model has become the main econometric approach for estimating *ex post* the "partial" (or direct) effects of economic integration agreements and other trade policy measures on bilateral trade flows. Our estimation strategy follows that of Baier and Bergstrand (2007). In particular, we control for multilateral resistance terms by including exporter-time and importer-time fixed effects. As Anderson and van Wincoop (2003) emphasised, the gravity model theory implies that it is not just bilateral trade costs (the bilateral resistance to trade, which is a function of the distance, the use of a common language, etc.), but also the trade costs relative to the

[5] Recent work in international trade emphasizes that trade policies should be treated as endogenous rather than exogenous determinants of trade (Baier and Bergstrand, 2007). In this paper we treat endogeneity bias with country-pair fixed effects. See sections 2 and 4 for a more detailed discussion on this issue.

rest of the world (the multilateral resistance to trade) that are relevant for predicting bilateral trade flows. Moreover, we control for endogeneity by means of bilateral fixed effects. This issue has received a great deal of attention in the empirical gravity-equation literature since Baier and Bergstrand (2007) noted that trade agreements are not exogenous and showed that *ex post* estimation of the partial effects of free trade agreements (FTA) suffered from endogeneity bias, mainly due to self-selection of country-pairs into agreements.[6]

Our benchmark specification is the gravity equation (1), which comprehensively accounts for multilateral resistance terms by including time-varying fixed effects and for self-selection endogeneity bias with country-pair fixed effects:[7]

$$lnX_{ijt} = \beta_0 + \beta_1 CU_{ijt} + \beta_2 PTA_{ijt} + \beta_3 GATT/WTO_{ijt} + \beta_4 NRPTAXbenMdev_{ijt} + \beta_5 NRPTAXdevMben_{ijt} + \eta_{ij} + \chi_{it} + \lambda_{jt} + u_{ijt} \quad (1)$$

where *i* and *j* denote trading partners, *t* is time, and the variables are defined as follows: X_{ijt} are the bilateral export flows from *i* to *j* in year *t*, *CU*, *PTA*, *GATT/WTO* are binary variables for common membership in currency unions, preferential trade agreements and General Agreement on Tariffs and Trade/World Trade Organization, $NRPTAXbenMdev_{ijt}$ ($NRPTAXdevMben_{ijt}$) is a binary variable which is unity if *i* is a beneficiary (benefactor) of a nonreciprocal preferential trade agreement and *j* is the corresponding preference-giving (beneficiary) country, η_{ij} are country-pair fixed effects, χ_{it} and λ_{jt} are exporter-

[6] Recent empirical work on the determinants of trade flows has increasingly relied on a theoretically motivated gravity equation that controls simultaneously for multilateral resistance terms with time-varying fixed effects and for unobserved bilateral heterogeneity including country-pair fixed effects. See, for example, Baier et al. (2008), Gil-Pareja et al. (2008a,b), Eicher and Henn (2011a,b), Fugazza and Nicita (2013), Dutt et al. (2013), Behar and Cirera-i-Crivillé (2013), Kohl (2014) or Gil et al. (2016b).

[7] Note that the inclusion of time-varying fixed effects in the gravity equation accounts for the multilateral terms as well as variation in all time-varying country variables such as GDPs. Moreover, the inclusion of county-pair fixed effects, in addition to controlling for the impact of any time-invariant determinant of trade (observed or not), also controls for endogeneity.

year and importer-year fixed effects, respectively, and u_{ijt} is the standard classical error term.

The benchmark specification includes only one dummy for all (reciprocal) preferential trade agreements (PTA). In order to investigate the issues addressed in this paper, we disaggregate the dummy variable PTA in three different ways by interacting the PTA dummy with dummies for whether the exporter and/or importer countries are or not beneficiaries of nonreciprocal preferential trade agreements. Firstly, we split this dummy into two dummies depending on whether the exporter is a beneficiary country (*PTAXben*) or a developed country (*PTAXdev*). Secondly, we split the PTA dummy into two from the importer's perspectives (denoted by *PTAMben* and *PTAMdev*). Finally, and most importantly, we split the PTA dummy into four dummies taking into account the group to which each trading partner in the pair belong: Exporter beneficiary and importer developed (*PTAXbenMdev*), exporter developed and importer beneficiary (*PTAXdevMben*), exporter and importer beneficiary (*PTAXbenMben*) and exporter and importer developed (*PTAXdevMdev*). For further clarification let consider the first of these dummies as an example. *PTAXbenMdev* is a dummy that is unity if country *i* is a beneficiary country of a nonreciprocal trade agreement and country *j* is a developed country and they share membership in a reciprocal preferential trade agreement and zero otherwise. Comparing the estimated coefficient for this variable with that obtained for *NRPTAXbenMdev* allows us to test whether reciprocal or nonreciprocal trade agreements have been best to promote exports from developing countries. In a similar way, we can compare the export performance of developed countries participating in reciprocal (*PTAXdevMben*) and nonreciprocal (*NRPTAXdevMben*) trade agreements in trade with beneficiary countries.

Moreover, we go further than Baier and Bergstrand (2007) because we additionally account for heteroskedastic residuals and zero trade flows. Starting with Santos Silva and Tenreyro (2006), a large number of recent papers (see, for example, Liu, 2009; Felbermayr and Kohler, 2010; Herz and Wagner, 2011; Egger and Larch, 2011; Bergstrand, Larch and Yotov, 2015; Gil et al., 2014 and 2016a, b) deal with econometric problems resulting from heteroskedastic residuals in log-linear gravity equations and the prevalence of zero bilateral trade flows using non-linear Poisson maximum-likelihood estimators. We address these issues by estimating the gravity equation in levels rather than in logs with the fixed effects Poisson maximum likelihood estimator.

3. Data

Data on the dependent variable (bilateral export flows) come from the "Direction of Trade" dataset (IMF). The sample covers 177 countries and territories over 13 years of the period 1960-2008 at four-year intervals (1960, 1964, …, 2008). GDP data in constant US dollars are taken from the World Development Indicators (World Bank). Data for distance, contiguity, island and landlocked status, common language, colonial ties, common religion, currency unions and common country background data are taken from the CIA's World Factbook. The indicators of preferential trade agreements and GATT/WTO have been built using data from the World Trade Organization. [8] Data on the one-way trade preferences come from different sources. Data on the African Growth and Opportunity Act and Everything but Arms initiative come from the corresponding websites.[9] The list of beneficiaries of the Caribbean Basin Initiative and the Andean Trade

[8] In this study we use the expression "preferential trade agreement" to also refer to other agreements involving a higher degree of economic integration. In fact, most economic integration agreements considered in the sample are free trade agreements.

[9] See, http://www.agoa.gov/eligibility/country_eligibility.html for membership in AGOA and http://ec.europa.eu/trade/wider-agenda/development/generalised-system-of-preferences/everything-but-arms for EBA.

Preference Act come from the Office of the United States Trade Representative. The listing of beneficiaries of the Cotonou Agreement (ACP-EU Partnership Agreement) comes from its website[10] and Head, Mayer and Ries (2010). The list of countries that are beneficiaries of the standard GSP programs are taken from the United Nations Conference on Trade and Development (UNCTAD, 2001, 2005, 2006 and 2008). For previous years, we use data from UNCTAD kindly provided by Bernard Herz and Marco Wagner. The list of developed countries includes those countries that have never been beneficiaries of one-way trade preferences (Australia, Austria, Belgium-Luxembourg, Canada, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Israel, Italy, Japan, the Netherlands, New Zealand, Norway, Portugal, South Korea, Spain, Switzerland, Sweden, the United Kingdom and the United States) plus Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovak Republic and Slovenia (after their accession to the European Union in 2004), and Bulgaria and Romania (after their accession to the European Union in 2007)

4. Empirical results

In line with recent empirical work focused on estimating the effects of economic integration agreements on bilateral trade flows using the gravity equation (see, among others, Eicher and Henn, 2011a, b; Fugazza and Nicita, 2013; Dutt et al., 2013; Gil-Pareja et al., 2014, 2016a, b) we begin by estimating a restricted version of gravity equation (1) including bilateral time invariant trade supporting or impeding measures, instead of bilateral fixed effects. In particular, we include the logarithm of bilateral distance (*D*) as well as dummy variables for adjacency (*Cont*), the use of a common language (*Lang*), the existence of colonial ties (*Colony*), common country in the past (*ComCount*) and for the

[10] http://ec.europa.eu/trade/wider-agenda/development/economic-partnerships

insularity (*Island*) or the landlocked status of nations in the pair (*Landl*). Additionally, we add an index of common religion (*CReligion*).[11] This specification also includes exporter-time and importer-time dummies in order to capture any exporter specific and importer specific time-variant variable (such as GDPs) as well as all other time-varying country-specific unobservables affecting trade, including the theoretical multilateral resistance terms (Anderson and van Wincoop, 2003).

Column 1 of Table 1 reports the benchmark results including only a dummy for all PTAs. This specification allows us to check whether the endogeneity of economic integration agreements biases coefficient estimates (upward or downward). As it is usual, the gravity equation works well explaining 70 per cent of the variation of bilateral exports flows. Overall, the results for the time-invariant controls are economically sensible in sign and size and highly statistically significant. Moreover, all estimated coefficients for the economic integration agreements present an estimated coefficient that is positive and statistically significant at conventional levels. In particular, the variable for reciprocal preferential trade agreements (*PTA*) and GATT/WTO membership show the highest estimated coefficient (0.771 and 0.752), whereas nonreciprocal agreements show smallest estimated coefficients (0.242 for exports from beneficiary countries to developed countries and 0.112 for exports in the opposite direction).[12]

As noted before, unobserved bilateral heterogeneity may yield biased results. Therefore, we next estimate gravity equation (1), which accounts for any observed or unobserved time-invariant determinant of trade by adding country-pair fixed effects

[11] The index is defined as: (% Protestants in country *i* * % Protestants in country *j*) + (% Catholics in country *i* * % Catholics in country *j*) + (% Muslims in Country *i* * % Muslims in country *j*).
[12] The Wald test rejects, at the 10 per cent level of significance, the null hypothesis of equality between the estimated coefficients for *XNRPTA* and *MNRPTA*.

(column 2).[13] In this specification all time-invariant regressors are absorbed into the pair-specific fixed effects. As we can see, the results with country-pair fixed effects reduce the magnitude of the estimated coefficients in 4 of the 5 trade policy variables (the exception is the variable *NRPTAXdevMben*). It suggests that trade agreements tend to form between trading partners whose bilateral trade has been "naturally" elevated due to unobserved factors. Thus, according to this result the likely endogeneity of economic integration agreements biases the coefficient estimates upward (incorrectly attributing "natural" trading characteristics to trade agreements) and so, henceforth the specification including both bilateral fixed effects and exporter-time and importer-time fixed effects will be our preferred specification. [14]

Column 3 and 4 report the results when we split the PTA dummy from the exporter and the importer perspectives, respectively. In the first case, there are no differences in the impact of PTAs depending on whether the exporter is a beneficiary or a developed country (regardless of the group to which belong the trading partner). In particular, coefficient estimates are very close (0.241 for PTAs in which the exporter is a beneficiary country and 0.232 for PTAs in which the exporter is a developed country). In contrast, when the PTA dummy is split from the importer perspective, the estimated coefficient is positive in both cases but significantly higher (at the 1 per cent level of significance) when the importer is a developed country (0.383) than when it is a beneficiary country (0.166).

The next natural step is to split the PTA dummy taking into account the group to which the trading partner belong for exports of both groups of countries (column 5). The

[13] In line with Baier and Bergstrand (2007), the inclusion of both country-year and country-pair dummies allows us to control for selection of countries and country-pairs into the trade policy variables considered in this paper.

[14] Our finding is in line with that Eicher and Henn (2011a,b) who find smaller estimated coefficients when they add unobserved bilateral heterogeneity controls. However, Baier and Bergstrand (2007) find a larger estimated coefficient for free trade agreements accounting for both country-year fixed effects and country-pair fixed effects (0.48) than using OLS with time dummies (0.27).

results suggest that preferential trade agreements have a positive effect for exports from beneficiary countries to developed countries but not in the opposite direction. Additionally, we find that regardless the preferential trade agreement is signed between two developed countries or two beneficiary countries, it is associated with a rise in bilateral trade, not being the difference between the estimated coefficients statistically significant at conventional levels.

With regard to the comparison between reciprocal (PTAs) and nonreciprocal agreements, our results reveal that for exports from beneficiary countries to developed countries both dummies are positive and significant but PTAs have had a significantly larger impact (at the 10 per cent level). However, surprisingly, for exports from developed countries to beneficiary countries only nonreciprocal agreements show a significant effect.

As a robustness check, we also estimate the gravity equation addressing for both heteroskedasticity bias (due to Jensen's inequality) and the presence of zeros in bilateral trade flows using the Poisson maximum-likelihood (PML) estimator.[15] Since the Poisson estimator did not achieve convergence including both time-varying fixed effects and country-pair fixed effects, in the Poisson regressions we include country-pair fixed effects to control for the potential problem of endogeneity (self-selection) bias, year dummies to account for common shocks and trends shared by all countries and the GDPs of the exporter and the importer instead of time-varying fixed effects (see, for example, Liu, 2009 and Herz and Wagner, 2011).

The results of the PML estimator with country-pair fixed effects including zeros appear in column 6. The coefficient estimates of the trade policy variables are similar to

[15] Monte Carlo simulations lead Head and Mayer (2013, p. 50) to conclude that "While Poisson PML has many virtues… it should not replace OLS as the new workhorse estimator of gravity equations. Rather, Poisson PML should be used as part of a robustness-exploring ensemble…"

those reported in column 5 (despite it accounts for heteroscedasticity bias and zero trade flows) but in this case all of them are positive and statistically significant, including the dummy that capture the effect of PTAs in exports from developed countries to beneficiary countries. Moreover, comparing the effect on exports of reciprocal and nonreciprocal agreements, we do not find significant differences despite that, in line with our previous results, the point estimate is larger for exports from beneficiary countries to developed countries in the case of reciprocal agreements. Column 7 excludes zeros from the regressions. These estimates suggest that ignoring zeros has a little effect on the results. In particular, the estimated coefficients for *PTAXbenMdev*, *PTAXdevMben*, *NRPTAXbenMdev* and *NRPTAXdevMben* remain nearly unaltered with respect to those reported in column 6 and again we do not find significant differences in the impact of trade agreements between reciprocal and nonreciprocal agreements neither for export from beneficiary countries to developed countries nor for exports in the opposite direction.

Until now the comparison between reciprocal and nonreciprocal trade agreements is based on PTAs and with this aim in mind we have split the PTA dummy according to the group to which the trading partners belong. However, as noted before the multilateral trade liberalization under the auspices of the GATT/WTO is also reciprocal in nature. The empirical evidence about the impact of the GATT/WTO across groups of countries (developed versus developing) is mixed. Subramanian and Wei (2007) and Dutt et al. (2013) find that GATT/WTO membership promotes trade in industrial countries but not in developing countries. In stark contrast, Felbermayr and Kohler (2010) find that GATT/WTO membership has a positive effect on trade only for developing countries and only for the WTO period. Eicher and Henn (2011a) do not find evidence of a positive effect in any case, and even a negative effect for developing countries in their preferred

specification.[16] On the contrary, Kohl (2015) and Gil-Pareja et al. (2016b) find a positive effect for both groups of countries.

Table 2 presents the results when we repeat the regressions in columns 3 to 7 of Table 1 but disaggregating in this case the GATT/WTO dummy following the same procedure used with the variable PTA. When we split this variable from the exporter perspective (column 1) we find a statistically larger effect on trade for exports from developed countries than for exports from beneficiary countries. The same picture emerges from the importers perspective (column 2) suggesting that GATT/WTO membership promotes trade strongly between developed countries. In fact, when we further disaggregate the GATT dummy taking into account the group to which exporters and importers belong, we find that the largest estimated coefficient is found for trade between developed country members and the smallest for trade between beneficiary countries (column 3). Moreover, the estimated coefficient is larger for exports from beneficiary countries to developed countries and the difference is statistically significant at the 5 per cent level. In short, the GATT/WTO impact on trade across groups of countries is uneven but positive and statistically significant at the 1% level in all cases.

Comparing the estimated coefficients for the GATT/WTO and the nonreciprocal trade agreements we find that for exports from beneficiary countries to developed countries both dummies (*GATTXbenMdev* and *NRPTAXbenMdev*) are positive and significant and that the impact has been larger for the GATT/WTO (statistically significant at the 5 per cent level). In the case of exports from developed countries to beneficiary countries the estimated coefficients are positive and very similar in magnitude in both cases.

[16] Subramanian and Wei (2007, p. 161) also find a negative and statistically significant coefficient for the developing country GATT/WTO dummy (-0.313) that vanishes when they exclude observations with values of trade less than $500,000. Additional evidence of negative and significant effects is provided by Felbermayr and Kohler (2010) for both industrial and developing countries over the GATT sub-periods.

Finally, columns 4 and 5 present the results using the Poisson maximum likelihood estimator with country-pair fixed effects including and excluding zeros. In both cases, the point estimates are very similar to those reported in column 3 for the log-linear specification. Again the point estimate is larger for exports from beneficiary countries to developed countries in the case of the reciprocal agreement (including and excluding zeros) but in these specifications the differences between the point estimates are not statistically significant at conventional levels.

5. Conclusions

The increase of exports from developing countries has long been considered an essential element to promote economic development. Over the last decades developed countries have provided preferential access to their markets to developing countries through nonreciprocal trade agreements. Moreover, developing countries have also participated in reciprocal trade agreements (bilateral, plurilateral or multilateral). For the first time to our knowledge, in this paper we investigate comparatively the effect of reciprocal and nonreciprocal trade agreements on exports from developing countries to developed countries but also on exports on the opposite direction.

Our results suggest that for exports from beneficiary countries to developed countries both reciprocal and nonreciprocal agreements have had a positive effect. However, according to our preferred specification the effect is larger for reciprocal than for nonreciprocal agreements, which gives support to the argument raised by critics of nonreciprocal preference regimes who consider that developing countries should abandon their reliance on one-way trade preferences in favor of reciprocal agreements. When we examine the impact of trade agreements on trade flows from developed countries to

beneficiary countries the impact is also positive for both reciprocal and nonreciprocal agreements but, in this case, it is very similar in magnitude.

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Table 1. Results from the gravity equation. Sample period 1960-2008 at four-year intervals.

Variables	(1) CYFE	(2) CYFE & CPFE	(3) CYFE & CPFE	(4) CYFE & CPFE	(5) CYFE & CPFE	(6) PML with CPFE (including zeros)	(7) PML with CPFE (excluding zeros)
LnY_i						1.026	1.022
						(0.088)***	(0.088)***
LnY_j						0.774	0.765
						(0.062)***	(0.060)***
Ln D	-1.278						
	(0.021)***						
Cont	0.532						
	(0.080)***						
Lang	0.479						
	(0.036)***						
Colony	1.465						
	(0.099)***						
ComCount	2.360						
	(0.125)***						
Island	0.688						
	(0.077)***						
Landl	-0.645						
	(0.063)***						
CReligion	0.280						
	(0.048)***						
CU	0.622	-0.159	-0.159	-0.168	-0.175	0.084	0.094
	(0.108)***	(0.109)	(0.109)	(0.109)	(0.109)	(0.041)**	(0.041)**
PTA	0.771	0.237					
	(0.043)***	(0.040)***					
PTAXben			0.241				
			(0.046)***				
PTAXdev			0.232				
			(0.067)***				
PTAMben				0.166			
				(0.044)***			
PTAMdev				0.383			
				(0.071)***			
PTAXbenMdev					0.365	0.394	0.395
					(0.071)***	(0.168)**	(0.171)**
PTAXdevMben					0.069	0.211	0.211
					(0.066)	(0.120)*	(0.122)*
PTAXbenMben					0.206	0.150	0.086
					(0.056)***	(0.081)*	(0.065)
PTAXdevMdev					0.381	0.480	0.490
					(0.095)***	(0.183)***	(0.133)***
GATT/WTO	0.752	0.297	0.298	0.292	0.296	0.313	0.303
	(0.053)***	(0.047)***	(0.047)***	(0.047)***	(0.047)	(0.066)***	(0.065)***
NRPTAXbenMdev	0.243	0.193	0.193	0.208	0.211	0.249	0.245
	(0.049)***	(0.054)***	(0.054)***	(0.055)***	(0.055)***	(0.079)***	(0.079)***
NRPTAXdevMben	0.112	0.181	0.181	0.188	0.189	0.247	0.242
	(0.041)***	(0.041)***	(0.042)***	(0.042)***	(0.042)***	(0.051)***	(0.051)***
CYFE	Yes	Yes	Yes	Yes	Yes	No	No
CPFE	No	Yes	Yes	Yes	Yes	Yes	Yes
Time dummies	No	No	No	No	No	Yes	Yes
No observat.	134,718	134,718	134,718	134,718	134,718	169,198	111,927
Adj/Within-R^2	0.70	0.37	0.37	0.37	0.37	-	-

Notes: The regressand in columns 1 to 5 is the log of real bilateral exports. The regressand in columns 6 and 7 is the value of real bilateral export flows. Robust standard errors (clustered by country-pairs) are in parentheses.* significant at 10%; ** significant at 5%; *** significant at 1%. CYFE indicates time-varying exporter and importer fixed effects. CPFE indicates country-pair fixed effects. Coefficient estimates for CYFE and CPFE are not reported for brevity.

Table 2. Results from the gravity equation. Sample period 1960-2008 at four-year intervals.

Variables	(1) CYFE & CPFE	(2) CYFE & CPFE	(3) CYFE & CPFE	(4) PML with CPFE (including zeros)	(5) PML with CPFE (excluding zeros)
LnY_i				1.040	1.036
				(0.086)***	(0.086)***
LnY_j				0.795	0.782
				(0.059)***	(0.058)***
CU	-0.151	-0.142	-0.157	0.098	0.107
	(0.108)	(0.108)	(0.108)	(0.041)**	(0.041)***
PTA	0.237	0.235	0.200	0.317	0.310
	(0.040)***	(0.040)***	(0.040)***	(0.071)***	(0.071)***
GATTXben	0.239				
	(0.050)***				
GATTXdev	0.405				
	(0.056)***				
GATTMben		0.178			
		(0.050)***			
GATTMdev		0.518			
		(0.063)***			
GATTXbenMdev			0.401	0.379	0.360
			(0.065)***	(0.078)***	(0.08)***
GATTXdevMben			0.240	0.321	0.315
			(0.058)***	(0.090)***	(0.091)***
GATTXbenMben			0.143	0.123	0.105
			(0.054)***	(0.134)	(0.129)
GATTXdevMdev			1.136	0.864	0.860
			(0.089)***	(0.083)***	(0.083)***
NRPTAXbenMdev	0.192	0.165	0.208	0.214	0.209
	(0.054)***	(0.054)***	(0.054)***	(0.092)**	(0.093)**
NRPTAXdevMben	0.170	0.179	0.211	0.233	0.227
	(0.041)***	(0.041)***	(0.042)***	(0.058)***	(0.058)***
CYFE	Yes	Yes	Yes	No	No
CPFE	Yes	Yes	Yes	Yes	Yes
Time dummies	No	No	No	Yes	Yes
No observat.	134,718	134,718	134,718	169,198	111,927
Within-R^2	0.37	0.37	0.37	-	-

Notes: The regressand in columns 1 to 3 is the log of real bilateral exports. The regressand in columns 4 and 5 is the value of real bilateral export flows. Robust standard errors (clustered by country-pairs) are in parentheses.* significant at 10%; ** significant at 5%; *** significant at 1%. CYFE indicates time-varying exporter and importer fixed effects. CPFE indicates country-pair fixed effects. Coefficient estimates for CYFE and CPFE are not reported for brevity.