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Trade Agreements in South Asia

Towards a Successful Story in the Developing World

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Abstract

This paper quantifies the trade creation effects of South Asia's trade agreements within the region and with the rest of the world. The paper uses an extensive database of bilateral trade covering the manufacturing, agriculture, and service sectors in 190 countries over 1990–2015. The estimates of various specifications of a structural gravity model, including domestic trade flows, capture the potential heterogeneous effects. The main finding is that these effects are in general stronger for trade agreements signed by South Asian countries and even stronger in the case of intraregional agreements. The effects of free trade agreements vary substantially among countries and sectors and between final and intermediate goods. The paper shows that the trade policy implemented in South Asia in the previous decades has been successful, but at the same time the results point toward the existence of clear missing opportunities for the region. The opportunities lay in (i) better backward integration with the rest of the world to improve efficiency and help strengthen exports, and (ii) further deepening of intraregional agreements to continue making progress in regional integration.

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Trade Agreements in South Asia:

Toward a Successful Story in the Developing World

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1 Introduction and Motivation

Countries in South Asia have signed regional trade agreements (RTAs) within the region and with third countries in the rest of the world.[1] These RTAs are expected to contribute to increasing the region's exports by reducing tariffs and non-tariff barriers, increasing productivity, facilitating technological transfers, and ultimately promoting economic growth and development. Unfortunately, the empirical evaluations of these agreements that take the most recent advances in the literature are limited. This limited evidence is not surprising given that the methodological advances and empirical analyses on RTAs' effects have usually been conducted using data covering a small set of countries, usually advanced economies. These advances tend to be more demanding in terms of data and this might be the reason why the literature uses data sets with a relatively small number of countries.[2] This makes the evidence of the trade creation effect of trade agreements in developing countries remains not widely available.

South Asia is an interesting case study in terms of potentially heterogeneous effects of FTAs due to the variation in terms of size and economic development in the region. This paper focuses not only on the aggregate effect of trade agreements in South Asia but also pays attention to the heterogeneous effects by sectors, country, country-pairs, types of goods, and the difference between intra-regional RTAs and those with the rest of the world. To empirically identify the RTAs' effect on South Asia, I use data covering 190 countries over a long period (1990-2015). I use an empirical strategy consistent with theory, in particular, I include domestic trade flows and explore different specifications to capture the heterogeneous effects of trade agreements over different dimensions.

Recent contributions to the literature show that RTAs' effects can be disappointing and vary widely across different RTAs when these results are available (Baier et al., 2019). Among the recommendations in the literature to properly capture a trade agreement's effect, the inclusion of domestic trade flows is one of the priorities. Yotov (2022b) review the related literature on this issue and argues that there are significant benefits from adhering to theory by estimating gravity equations with domestic (in addition to international) trade flows. I make use of domestic trade flows to carry out theory-consistent

[1] I use the term Regional Trade Agreements to refer to Free Trade Agreements (FTAs), as done in the literature and as reported to the World Trade Organization (WTO).

[2] The structural gravity model, which is commonly used in evaluating the RTA effects, continues to develop rapidly in the literature and it is now more refined, in particular after Baier and Bergstrand (2007).

policy analysis, linking the gravity theory and the empirical parts. This also points to opportunities for policy applications, with South Asia as an example.

The main results show that the trade creation effects of South Asia's agreements are large, positive, and significant in general. These effects of FTAs vary substantially among countries in the region and sectors. Intra-regional agreements, like the South Asia Free Trade Area (SAFTA), show stronger trade creation effects than the world average and stronger than those agreements signed by countries in the region with third countries in the rest of the world. This contributes to the goal of regional integration. The inclusion of domestic trade flows proves to be key in capturing these effects and understanding the mechanisms behind them. The effects on the agriculture sector trade within the region are particularly strong and prove to be encouraging for food security, regional integration, and development. To capture the Global Value Chains dimension and overall integration into the world economy, the results differentiate between final and intermediate goods, showing a stronger effect for final goods. The GVC trade measures from Borin et al. (2021) are used to study the impact on integration both backward (use of foreign value added in domestic production) and forward (export of domestic value added consumed in third countries after being further processed). Here, the results suggest that while at the world average level there is no significant impact, RTAs in South Asia do have a positive effect on these GVC measures.

The trade agreements implemented in South Asia in the previous decades have been successful, but at the same time, the results point toward the existence of clear missing opportunities for the region. These include better backward integration with the rest of the world to improve efficiency and help strengthen exports via access to foreign markets and further deepening of the intra-regional SAFTA agreement to continue making progress in regional integration.

The rest of the paper is organized as follows: Section 2 explains the methodology, building on the most recent contributions in the structural gravity literature and its empirical implementation. Section 3 introduces the data used to satisfy the demanding needs of data able to differentiate between sectors, types of goods, and domestic/international trade flows. Section 4 presents the results, starting with a comparison with the recent literature. Section 5 concludes.

2 Methodology: Structural Gravity Model

The gravity model of trade has always been the workhorse to estimate the impact of various trade policies and other determinants of trade flows, including the trade agreements' effects, thanks to its theoretical foundations and empirical success Yotov (2022a). Also important is the fact that the structural gravity model is representative of a very wide class of underlying micro-foundations. I follow the structural gravity system of equations, originally derived by Anderson (1979) and refined by Anderson and van Wincoop (2003):

$$X_{ij}^k = \frac{E_j^k Y_i^k}{Y^k} \left(\frac{t_{ij}^k}{P_j^k \Pi_i^k} \right)^{1-\sigma} \tag{1}$$

$$(P_j^k)^{1-\sigma^k} = \sum_i \left(\frac{t_{ij}^k}{\Pi_i^k} \right)^{1-\sigma^k} \frac{Y_i^k}{Y^k} \tag{2}$$

$$(\Pi_i^k)^{1-\sigma^k} = \sum_j \left(\frac{t_{ij}^k}{P_j^k} \right)^{1-\sigma^k} \frac{E_j^k}{Y^k} \tag{3}$$

where $X_{ij,t}^k$ denotes the value of exports from origin country i to destination country j in sector k. $X_{ij,t}^k$ includes domestic trade flows $X_{ii,t}^k$, necessary to link the gravity theory presented above and this empirical part. Yotov (2022b) reviews the related literature on this issue and argues that there are significant benefits from adhering to theory by estimating gravity equations with domestic (in addition to international) trade flows. Among these benefits, the most important for this paper is that the use of domestic trade flows allows for the identification of the trade-diversion effects of bilateral trade policies (Dai et al., 2014). E_j denotes total expenditure on sector k at destination j, while Y_i^k denotes total output value k from country i to all destinations. Y is the total world output of goods k. σ^k is the trade elasticity of substitution across origin countries i in goods k. Π_i is the outward multilateral resistance, which consistently aggregates the trade costs faced by the producers in each region i as if they ship to a uniform world market. Similarly, the inward multilateral resistance, P_j , consistently aggregates the trade costs on the consumers in each region j as if they buy from a uniform world market.

To obtain the estimates of the trade agreements effect, I translate the structural gravity

equation (1) into the following econometric model:

$$X_{ij,t}^{k} = \exp\left(\mu_{i,t}^{k} + \tau_{ijt}^{k} + \pi_{j,t}^{k}\right) + \varepsilon_{ij,t}^{k} \tag{4}$$

Equation (4) conveniently decomposes the factors determining bilateral trade into three terms, plus the error term. The fixed effect terms $\mu_{i,t}$ and $\pi_{j,t}$ control for the multilateral resistances and size variables in origin and destination respectively. I use the PPML estimator following the recommendations of Santos Silva and Tenreyro (2006) to avoid the OLS bias due to Jensen's inequality and the proven equivalence between structural gravity and gravity with fixed effect when PPML is used (Fally, 2015). The bilateral trade cost part, τ_{ij}, control for trade determinants at the bilateral level. The most robust empirical specification of this part to estimate the RTA effects is the following:

$$\tau_{ijt}^{k} = \beta_{rta} RTA_{ij,t} + \sum_{t}^{T} \beta_t INT_{ij,t} + \gamma_{ij} \tag{5}$$

where $RTA_{ij,t}$ captures the presence of an RTA. Typically, gravity equations include other variables, such as dummies for sharing a common language, a common colonial history, a common land border, etc. Here the empirical specifications account for these variables with the asymmetric country-pair fixed effects, γ_{ij}, as recommended by (Baier and Bergstrand, 2007) to avoid the endogeneity bias of trade policy variables. INT_t controls for the globalization effects that can bias upward the RTA coefficient (Bergstrand et al., 2015). INT_t is an indicator variable equal to 1 for $i = j$ and zero otherwise, making it an exogenous variable that picks up all the relevant forces that discriminate between internal and international trade. Equation (5) is a robust empirical strategy to estimate the world average RTA effect, but this paper is interested in the specific effect RTAs in South Asia. For this, it is interesting to add the two variables that capture the additional effects of trade agreements signed by countries in the region, differentiating between intra-regional agreements and those that are signed with the rest of the world, as follows:

$$\tau_{ijt}^{k} = \beta_{rta} RTA_{ij,t} + \beta_{SAR} \times SAR_{ij,t} + \beta_{SARintra} \times SARintra_{ij,t} + \sum_{t}^{T} \beta_t INT_t \tag{6}$$

where β_{SAR} captures the additional effect of RTAs in the region and $\beta_{SARintra}$ the additional effect of RTAs signed within the region. This means that the total effect of an

RTA signed between South Asian countries is captured by $\beta_{rta} + \beta_{SAR} + \beta_{SARintra}$, while $\beta_{rta} + \beta_{SAR}$ captures the RTA effect when signed with the rest of the world.

$$\tau^k_{ijt} = \beta_{rta} RTA_{ij,t} + \sum_{i \in SAR} (\beta_{i,intra} \times RTA_{intra,t} + \beta_{i,ROW} \times RTA_{ROW,t}) + \sum_{t}^{T} \beta_t INT_t \quad (7)$$

There is one particular RTA effect that is worth estimating, that is the South Asian Free Trade Area (SAFTA). This agreement is the main intra-regional agreement and entered into force in 2006 for most countries in the region. To refine this estimation I model the bilateral trade costs part as follows:

$$\tau^k_{ijt} = \beta_{rta} RTA_{ij,t} + \sum_{t}^{T} \beta_{safta,t} SAFTA_{ij,t} + \sum_{t}^{T} \beta_t INT_t \quad (8)$$

where the $\beta_{safta,t}$ coefficients capture the SAFTA effect on trade over time, allowing us to observe the dynamics of its implementation.

3 Data

This paper studies the trade creation effects of trade agreements in South Asia. Important aspects of the effect of trade agreements are only properly captured when using data that cover as many countries as possible and when including domestic trade flows as the literature emphasizes. For this reason I use Eora multi-region input-output tables (Lenzen et al., 2012, 2013).

The Eora database consists of multi-region input-output (MRIO) tables that provide a time series of IO tables for 190 countries. I use the version at the common 26 sectors. In this model, all countries have been aggregated to a common 26-sector classification (see table (8)) and the supply-use tables have been converted to symmetric product-by-product IO tables using the Industry Technology Assumption. This MRIO thus contains only symmetric product-by-product and industry-by-industry IO tables. This data is basic prices and covers the period 1990-2015 for 190 countries.

While the empirical strategy presented in this paper is very demanding in terms of the data required, it does not require using Eora in full detail. I need bilateral trade flows at the sector level including domestic trade flows and differentiating by type of good (final and intermediate). Note that Eora provides sector-country to sector-country trade flows

for intermediate goods, but this kind of disaggregated data is not necessary for this paper and the assumptions necessary for that are not part of the data used in this paper.

4 Results

Before focusing on the trade effect of trade agreements in South Asia, it is a good idea to compare with the literature. The literature usually uses manufacturing data due to data availability and for comparability. Table (1) shows the results of the world average RTA effect using manufacturing trade data. Column 1 shows that without including domestic trade flows the effect is 0.02. When domestic trade flows are taken into account in the estimation the RTA coefficient increases. Column 2 shows that including domestic trade flows without controlling for border effects increases the RTA coefficient but it suffers from an upward bias as explained by Bergstrand et al. (2015). Column 3 uses domestic trade flows and control for border effects and shows a benchmark result of 0.10. This RTAs effect is below those seen in the literature when using small samples. For instance, Bergstrand et al. (2015) reports a mean coefficient of around 0.50 when covering 56 countries and Baier et al. (2019) reports a mean coefficient of 0.49 with a sample of 53 countries. But 0.10 is in line with studies covering most countries in the world economy. Recent examples of these studies are Felbermayr et al. (2022) use a sample of 186 countries and report a RTA coefficient of 0.12, and Larch et al. (2019) that reports a coefficient of 0.11. These results in table (1), and the small part of the literature covering as many countries as possible, show that the inclusion of more countries (that tend to be developing economies) uncovers a lower average RTA effect. These benchmark results will be key in understanding the effects of the heterogeneous trade agreements.

With these benchmark results at hand, I now focus on the RTA effects specific to South Asia countries. I continue to use data for the manufacturing sector to be able to compare the previous results and the literature in general. I am interested in disentangling the effects of the intra-regional RTAs and the RTAs that a South Asian country signs with a third country outside the region. Table (2) introduces these additional effects of RTAs in South Asia. Column 1 is the benchmark average result from table (1). Column 2 adds an interaction term of RTA in which at least one of the countries is from South Asia. It shows that the additional coefficient is 0.11. This leaves the trade creation effects on RTA

	(1) trade	(2) trade	(3) trade
RTA	0.02^{***}	0.27^{***}	0.10^{***}
	(4.78)	(32.39)	(12.70)
Domestic trade	NO	YES	YES
Border controls	NO	NO	YES
N	928746	933660	933660

Note: the variable RTA measures the world average effect of trade agreements. t statistics in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 1: Comparison to the literature

in South Asia in $23\% = \exp(0.10 + 011) - 1$, a 12% more than the world average effect of RTAs. This additional effect includes both intra-regional RTAs and RTAs with the rest of the world. For this reason, column 3 adds a specific term for intra-regional RTAs. It shows an additional effect of of RTA within the region is $22\% = \exp(0.20) - 1$ for a total effect of $49\% = \exp(0.10 + 0.10 + 0.20) - 1$, while RTAs of South Asia countries with the rest of the world see a total effect of $22\% = \exp(0.10 + 0.10) - 1$.

This is a very encouraging result for South Asia, showing strong trade creation effects for trade agreements in the region, with a stronger effect within the region itself. An interesting step would be to see how these results change if we control for large trade agreements like the European Union (EU) common market and RTAs signed between the EU and other countries. The reason for this control is that the EU is well-known for putting in place a deep trade agreement among its many members and this could affect the world average effect of RTAs and provide more insights. Table (3) introduces these controls. As expected, the world average effect is reduced to 8%, with the EU common market having an additional effect of 10%. The results for South Asia do not change much (the RTA with the rest of the world strengthens slightly with the reduction in the world average), but these results show that RTAs, both within the region and with the rest of the world, have had a stronger effect than the average of the EU trade agreements.[3]

[3]While this is a positive result for South Asia, it is later discussed in the conclusions section and put into the context of a lower starting level of trade flows.

	(1) trade	(2) trade	(3) trade
RTA	0.10***	0.10***	0.10***
	(12.70)	(11.97)	(11.97)
RTA × SAR		0.11***	0.10***
		(6.88)	(6.00)
RTA × SAR-intra			0.20***
			(5.70)
N	933660	933660	933660

Note: all regression include domestic trade flows and control for border effects. The variable RTA measures the world average effect of trade agreements. The SAR effect is measured as an addition to the average, and SAR-intra as an addition to the SAR effect. t statistics in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 2: South Asia manufacturing results

	(1) trade	(2) trade	(3) trade
RTA	0.10***	0.07***	0.08***
	(11.97)	(6.82)	(5.43)
RTA × SAR	0.10***	0.13***	0.12***
	(6.00)	(7.21)	(6.26)
RTA × SAR-intra	0.20***	0.20***	0.20***
	(5.70)	(5.76)	(5.75)
EU		0.11***	0.10***
		(8.90)	(6.69)
EU-ROW			-0.02
			(-1.11)
N	933660	933660	933660

Note: the variable RTA measures the world average effect of trade agreements. The SAR effect is measured in addition to the average, and SAR-intra is in addition to the SAR effect. The EU and EU-ROW effects are in addition to the world average RTA effect. t statistics in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 3: South Asia manufacturing results controlling for EU

So far, the data I have used is for the manufacturing sector. Now I focus on the agriculture and service sectors. These two sectors are also particularly important for South Asia given the weight of the agriculture sector in the economy of the countries in the region and the potential of the service sector to generate economic growth. Table (4) evaluates the RTA effect of these two sectors in the same way done with the benchmark results for the manufacturing sector, showing the world average, intra-regional, and rest of the world effects. Manufacturing results are included again for comparison purposes. Starting with the world average effects, the results suggest that RTAs have a similar effect in agriculture and manufacturing, slightly smaller. On the other hand, the service sector sees its RTA effect cut in half with respect to manufacturing. This is not surprising given the nature of services and trade barriers it might face, in this case at the global level. The specific results for South Asia are again interesting. The South Asia RTAs have a strong positive trade creation effect, but only for intra-regional ones with a total effect of $57\% = \exp(0.09 + 0.36) - 1$, above the total effect for manufacturing within the region.[4] In the service sector, the effect is positive, both intra-regional and with the rest of the world, with a total effect of $31\% = \exp(0.05 + 0.22) - 1$ for RTAs with third countries and $51\% = \exp(0.05 + 0.22 + 0.14) - 1$ within the region.

	Manufacturing		Agriculture		Services	
	(1)	(2)	(3)	(4)	(5)	(6)
	trade	trade	trade	trade	trade	trade
RTA	0.10^{***}	0.10^{***}	0.09^{***}	0.09^{***}	0.05^{***}	0.05^{***}
	(11.97)	(11.97)	(6.13)	(6.12)	(7.80)	(7.80)
RTA × SAR	0.11^{***}	0.10^{***}	0.08^{***}	0.01	0.23^{***}	0.22^{***}
	(6.88)	(6.00)	(2.70)	(0.33)	(12.30)	(11.13)
RTA × SAR-intra		0.20^{***}		0.36^{***}		0.14^{***}
		(5.70)		(7.10)		(4.09)
N	933660	933660	933660	933660	933660	933660

Note: the variable RTA measures the world average effect of trade agreements. The SAR effect is measured in addition to the average, and SAR-intra is in addition to the SAR effect. t statistics in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 4: South Asia sectoral results

Now that the results are available for different sectors, I look into the different uses

[4]Note that the RTA effect in the agriculture sector is the same as the world average.

of goods (and services) and the potentially different effects RTAs can have on them. The increasing trade in intermediate goods has been the most relevant characteristic of this globalization phase since at least the early 1990s. Disentangling the effect of RTAs for these two types of uses can help better understand how trade policy has been working in the region. Table (5) differentiate by sector and type of good. At the world average level, the only significant difference is in services, with the effect being stronger for input services, probably due to the nature of market services that are more used as intermediate consumption rather than final services and RTAs might reduce more trade barriers for the intermediate consummation of services. For RTA signed between a South Asian country and the rest of the world, it is the case across all sectors that the additional positive effect is always stronger for the final consumption of goods and services, in particular for agricultural goods, there is no additional effect with respect to the world average effect. Finally, for intra-regional trade agreements, we see that the additional effect is again stronger for the final consumption of goods and services, and the intermediate consumption for services gets the same effect from RTAs as those of South Asia with third countries. The general result here is that in South Asia trade agreements tend to stimulate more trade in final goods and services.

	Manufacturing		Agriculture		Services	
	(1)	(2)	(3)	(4)	(5)	(6)
	Finals	Inputs	Finals	Inputs	Finals	Inputs
RTA	0.10***	0.09***	0.08***	0.08***	0.03***	0.05***
	(11.36)	(11.30)	(8.64)	(5.43)	(3.76)	(7.09)
RTA × SAR	0.16***	0.08***	0.06**	-0.00	0.26***	0.18***
	(6.97)	(4.84)	(2.45)	(-0.06)	(10.45)	(8.69)
RTA × SAR-intra	0.23***	0.19***	0.45***	0.29***	0.25***	0.02
	(5.17)	(5.75)	(9.50)	(4.81)	(6.45)	(0.57)
N	928746	933660	928746	933660	928746	933660

Note: the variable RTA measures the world average effect of trade agreements. The SAR effect is measured in addition to the average, and SAR-intra is in addition to the SAR effect. t statistics in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 5: South Asia results by type of good

Table (5) evaluated bilateral GVC integration using trade in parts and components. This way we can use the structural gravity model. Table (6) uses a different way, sub-

stituting bilateral trade with bilateral GVC trade flows. For this purpose, I use a novel comprehensive method to measure GVC participation developed by Borin et al. (2021). They decompose GVC-related trade participation in three components: a backward component corresponding to the activities at the beginning of the chain, a forward component corresponding to the activities at the end of the chain, and an intermediate component (two-sided) for all activities encompassing both sourcing and selling intermediates (activities neither at the beginning nor at the end of the chain). The results show that, in general, RTAs do not have a positive effect on GVC-related trade participation, except for the small effect in agriculture. RTAs in South Asia have an additional effect of 2 to 3 percent in manufacturing and negative in agriculture. RTAs within South Asia on the other hand have a strong positive effect on manufacturing and even more on agriculture. These results show an important snapshot of the RTAs' effects at the world level. An average world RTA has little effect on GVC-related trade participation but there are some RTAs with a significant effect, with RTAs in South Asia among them.

	Manufacturing			Agriculture			Services		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	gvcbp	gvcfp	gvcmix	gvcbp	gvcfp	gvcmix	gvcbp	gvcfp	gvcmix
RTA	0.00	0.01	-0.00	0.03***	0.07***	0.04***	0.01**	0.00	-0.00
	(0.56)	(1.30)	(-0.71)	(7.12)	(13.50)	(8.01)	(2.57)	(0.50)	(-0.17)
RTA × SAR	0.02*	0.03***	0.03**	-0.15***	0.03**	-0.07***	0.00	0.01	0.00
	(1.87)	(3.28)	(2.56)	(-3.58)	(2.14)	(-2.78)	(0.67)	(0.90)	(0.80)
RTA × SAR-intra	0.12***	0.10***	0.08***	0.44***	0.06	0.23***	0.02***	0.00	0.02***
	(5.41)	(6.41)	(5.09)	(7.20)	(1.51)	(4.58)	(3.68)	(0.38)	(3.71)
N	922766	911368	921975	923708	913334	922928	923717	916146	923058

Note: the dependable variables are GVC participation measures with gvcbp standing for pure backward, gvcfp for pure forward, and gvcmix for two-sided. The variable RTA measures the world average effect of trade agreements. The SAR effect is measured in addition to the average, and SAR-intra is in addition to the SAR effect. *t* statistics in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 6: South Asia results by type of good

This paper, in line with recent contributions in the literature, emphasizes the importance of including domestic trade flows in the estimation of the RTA effects. So far, the trade flows used in the estimations have included domestic transactions. Now I study the implications of omitting the domestic part of the economy in this type of analysis. It is clear that all trade flows need to be included for having a complete model, but this exercise uncovers interesting details like the trade diversion effects on RTAs. Table (7)

shows the results for each sector including and omitting domestic trade flows. The general conclusion from these results for average, intra-regional, and with the rest of the world RTA effects is that omitting domestic trade flows underestimates the trade effect. This comes from the fact that trade agreements divert some domestic flows toward international trade. This is an intuitive result, already seen in the literature (Yotov, 2022b), since RTAs are expected to increase competition in the domestic economies, with foreign firms entering the market, and increasing the productivity of firms and improving the reallocation of resources. This is part of the objectives of signing a trade agreement. Results suggest that South Asian RTAs have worked in this line contributing to increase competition in domestic economies. This seems to have been the case with RTAs signed with the rest of the world, but even more within the region.

	Manufacturing		Agriculture		Services	
	(1)	(2)	(3)	(4)	(5)	(6)
	trade	trade	trade	trade	trade	trade
RTA	0.01***	0.10***	0.03***	0.09***	0.01	0.05***
	(4.13)	(11.97)	(2.91)	(6.12)	(1.40)	(7.80)
RTA × SAR	0.03***	0.10***	-0.02	0.01	-0.06**	0.22***
	(2.92)	(6.00)	(-0.48)	(0.33)	(-2.00)	(11.13)
RTA × SAR-intra	0.12***	0.20***	0.27***	0.36***	-0.07**	0.14***
	(5.62)	(5.70)	(5.84)	(7.10)	(-2.08)	(4.09)
Domestic trade	NO	YES	NO	YES	NO	YES
N	928746	933660	928746	933660	928746	933660

Note: the variable RTA measures the world average effect of trade agreements. The SAR effect is measured in addition to the average, and SAR-intra is in addition to the SAR effect. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 7: The role of domestic trade flows and trade diversion

Another area in which this paper has focused is to disentangle the heterogeneous effects of RTAs within the region and with the rest of the world. I carry out two more analyses to understand the different effects that have already been seen in the previous results. The first one is to estimate the specific effects of the South Asian Free Trade Area (SAFTA) agreement. This agreement is important since it is the core of the intra-regional trade agreements, with only a few country-pairs (like India- Sri Lanka) having an RTA in place with another South Asian country before SAFTA. I estimate not only SAFTA's effect,

but also its dynamics, that is to say how the effect evolved since its entry into force in 2006. Figure (1) plots the results differentiating by sector. The results show a phase-in of the agreement effects, starting with almost a 30% effect and increasing to a 60% level at the end of the sample period of the sample. All sectors seem to have very similar dynamics, with agriculture performing enter between 2010 and 2014 but eventually converging to the same effect as manufacturing and services.[5]

The second analysis is to study the effects of intra-regional agreements and with the rest of the world by each South Asian country and by sector. While we have observed strong results at the regional level, this has the potential of uncovering heterogeneous effects. Figure (2) shows the total effect of intra-regional RTAs of each country in the region. We observe different effects across countries and sectors, with most of them being positive, but we observe a few negative values.[6]

The same analysis is shown in figure (3) but for the RTAs of South Asian countries with third countries. In this case, results are only reported for India and Pakistan since these are the only two countries with trade agreements in place with the rest of the world. Results show that the RTA effects are strongly positive and significant for manufacturing and services, stronger in the case of Pakistan. Effects on agricultural products are lower, and non-significant in the case of India.

5 Conclusions

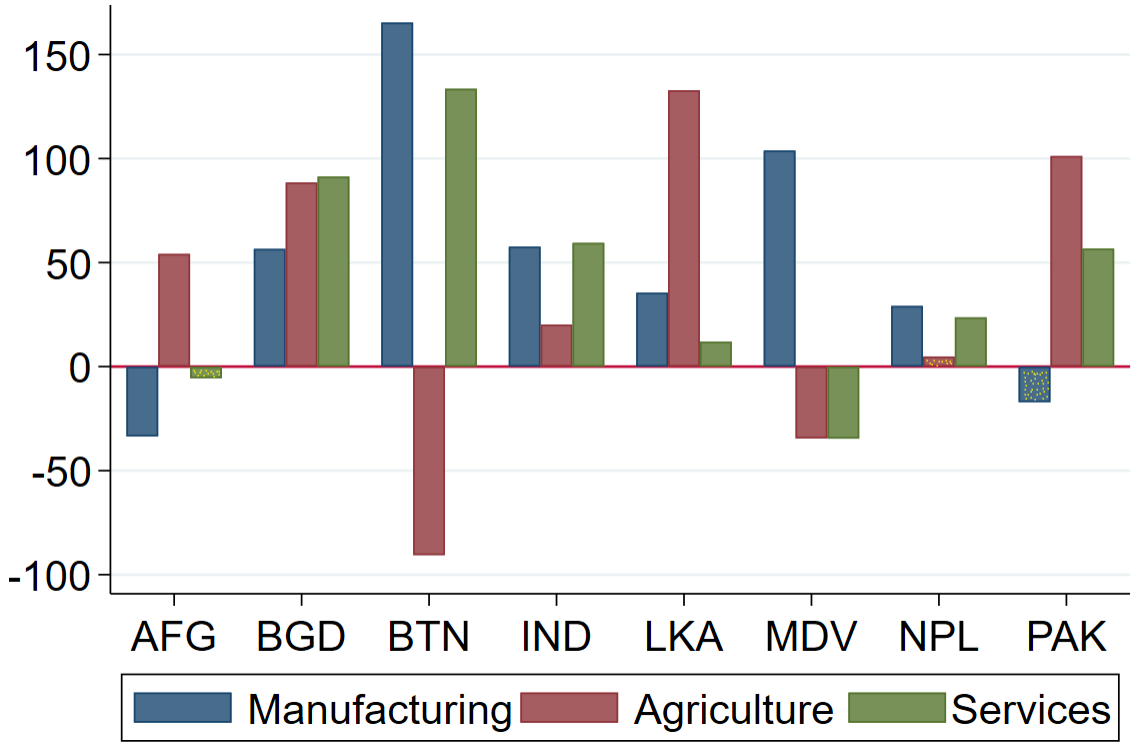
In this paper, I quantify the trade creation effects of South Asia's trade agreements. I am interested in capturing the heterogeneous effects so I differentiate by RTAs that South Asian countries have within and outside the region, across sectors, and type of goods among other empirical specifications that help in better understanding the results of trade agreements in the region. To my knowledge, the evidence for the case of South Asia is limited, and this paper tries to fill this gap by sticking to the most recent developments in the literature that calls for the inclusion of domestic trade flows and the need for including as many countries as possible for having a clear picture at the global level and of the

[5]Note that these results are specific to the SAFTA agreement and follow the effects over time. That explains the differences with respect to intra-regional RTAs in general that we have seen in previous results.

[6]Explaining the observed heterogeneous effects is beyond the scope of this paper. Regarding the few negative values, it is important to mention that they have been seen in the literature, even in studies using a relatively small sample of more developed countries like in Baier et al. (2019).

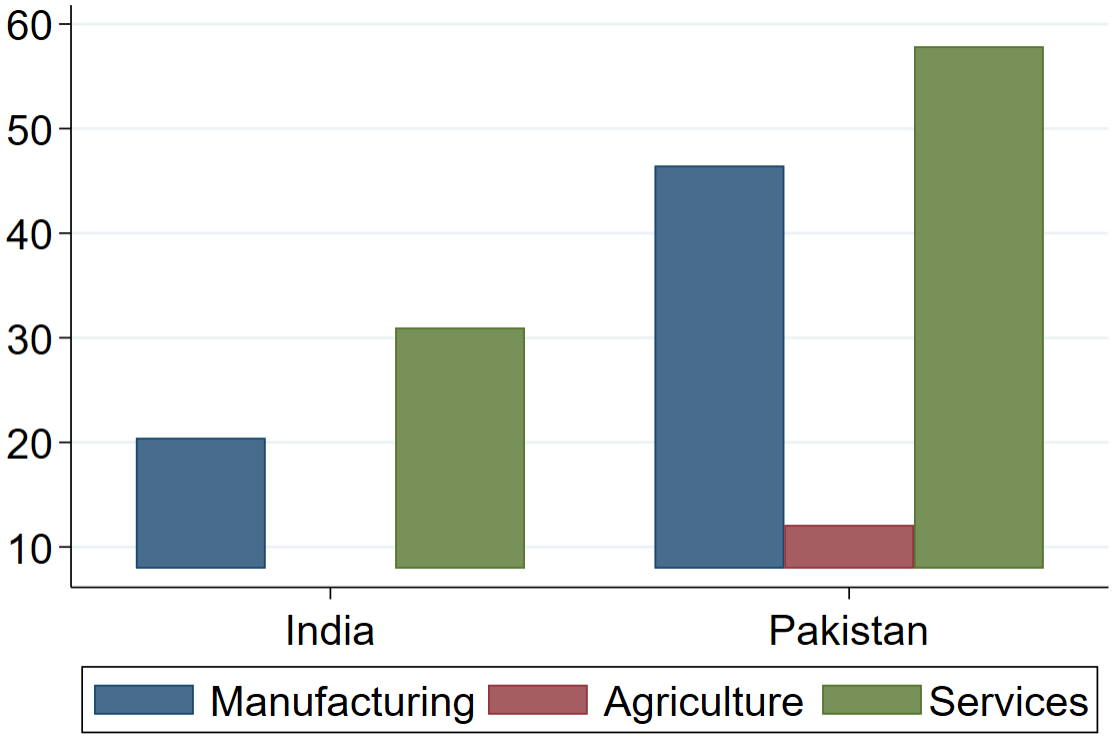
Note: the variable RTA measures the world average effect of trade agreements. The SAR effect is measured in addition to the average, and SAR-intra is in addition to the SAR effect. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Figure 1: SAFTA dynamics by sector



Note: the variable RTA measures the world average effect of trade agreements. The SAR effect is measured in addition to the average, and SAR-intra is in addition to the SAR effect. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Figure 2: Intra-regional RTAs by country



Note: the variable RTA measures the world average effect of trade agreements. The SAR effect is measured in addition to the average, and SAR-intra is in addition to the SAR effect. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Figure 3: RTAs with the rest of the world by country

developing world. I achieve this by using an extensive database covering manufacturing, agriculture, and services trade for 190 countries over the period 1990-2015, with domestic and international trade flows.

The main results show that the trade creation effects of South Asia's trade agreements are large, positive, and significant in general. Also, these effects of FTAs vary substantially among countries in the region, sectors, and between final and intermediate goods. Results also suggest that intra-regional agreements like SAFTA have had stronger trade creation effects contributing to the goal of regional integration. And the inclusion of domestic trade flows proves to be key in understanding these results and in comparing them to the average effects of international trade agreements. The case of the large effects on agricultural goods within the regions is of particular importance for food security and development.

In conclusion, this paper shows that the trade policy implemented in South Asia in the previous decades has been a success given the trade agreements that have been put in place. But at the same time, this paper uncovers the existence of clear missing opportunities in the region. Intra-regional effects are strong, in fact, stronger than the world average, but they need to be understood in the context of a relatively low level of trade flows and results suggest the possibility of the further deepening of the intra-regional trade agreements to benefit those countries with low effects and to further stimulate regional integration.

It seems many countries would benefit more from deepening existing trade agreements than from signing agreements with new partners. Many countries in South Asia do not have trade agreements with the rest of the world. This points towards clear missing opportunities for the region.

Preferential trade agreements have increased in number in recent years and extended their reach well beyond tariff reduction, covering investment, competition, and intellectual property rights issues (Mattoo et al., 2017). This means that South Asia loses in relative terms since other country pairs reduce their trade barriers. South Asia has the opportunity and needs to catch up. In particular, there is a need to work on the backward integration of the countries in the region with the rest of the world. Imports of intermediate goods from other countries have the potential to improve efficiency and quality, help strengthen exports, and support job creation in South Asia. Trade agreements present an

opportunity to make the most of the opportunities that lie geographical proximity to the trade hub of Asia, the possibility to gain access to larger markets, and increase access to imported goods and services that could support GVC participation and upgrading.

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Appendix

A Eora sectors

Table 8: Eora sectors and groups

Sector name	Sector group
1-Agriculture	Agriculture, forestry and fishing
2-Fishing	Agriculture, forestry and fishing
3-Mining and Quarrying	Others
4-Food & Beverages	Manufacturing
5-Textiles and Wearing Apparel	Manufacturing
6-Wood and Paper	Manufacturing
7-Petroleum, Chemical and Non-Metallic Mineral Products	Manufacturing
8-Metal Products	Manufacturing
9-Electrical and Machinery	Manufacturing
10-Transport Equipment	Manufacturing
11-Other Manufacturing	Manufacturing
12-Recycling	Manufacturing
13-Electricity, Gas and Water	Others
14-Construction	Others
15-Maintenance and Repair	Services
16-Wholesale Trade	Services
17-Retail Trade	Services
18-Hotels and Restraurants	Services
19-Transport	Services
20-Post and Telecommunications	Services
21-Finacial Intermediation and Business Activities	Services
22-Public Administration	Others
23-Education, Health and Other Services	Others
24-Private Households	Others
25-Others	Others
26-Re-export & Re-import	Others