Alessandro
Nicita

Mesut
Saygili

Trade Analysis Branch
Division on International
Trade and Commodities
UNCTAD

alessandro.nicita@unctad.org

mesut.saygili@unctad.org

Trade Agreements and Trade Resilience During COVID-19 Pandemic

Abstract

This paper considers whether trade in regional trade agreements has shown more resilience during the COVID-19 downturn. Using an econometric approach where a set of fixed effect controls for countries' specific characteristics, idiosyncratic shocks and policy responses, this paper finds that trade within trade agreements was relatively more resilient against the global trade collapse of 2020. The analysis also finds that the level of integration matters. Deep regional trade agreements have provided relatively better stability against the global shock. Importantly, the results show some heterogeneity across developing and developed countries as well as across the developing countries' regions.

UNITED NATIONS

Contents

Acknowledgements

1. Introduction

By drastically disrupting economic activities throughout the world, the COVID-19 pandemic has had detrimental effects on international trade. On average, the COVID-19 pandemic resulted in a trade downturn of about 7 per cent in value during 2020. Amid the global impact of the pandemic, there was considerable heterogeneity both in the timing and in the magnitude of the declines in trade flows across the globe. Such heterogeneous effects are not novel to economic crises, as most economic downturns result in trade flow adjustments which are different depending on primary causes and policy responses (Comunale *et al.* 2021). In the case of the COVID-19 pandemic, the effects on international trade have originated from demand and supply disruptions brought on by the health mitigation measures such as lockdowns, quarantines and travel restrictions. Those dynamics have been influenced by pre-existing elements (e.g. exposures to global value chains, import and export basket compositions) and policy responses (e.g. import and export facilitations and restrictions, domestic support packages and subsidies).[1]

Among the various elements contributing to the heterogeneous effects of COVID-19 on international trade, this paper considers whether trade subject to regional trade agreements (RTAs) was more resilient during the COVID-19 downturn.[2] There are a number of arguments for which intra-RTAs trade may have declined at a slower pace. One argument is that RTAs favour some trading relationship while weakening those not covered by the agreement (Dai *et al.* 2014; Dür *et al.* 2014). The reason is that trade within RTAs often benefit from better trade conditions and lower trade costs relative to trade outside RTAs (e.g. lower tariffs, cooperation in trade regulatory frameworks and on investment regimes).[3] Suppliers benefiting from lower transaction costs could be relatively more insulated from the fall in global demand during 2020.

Better contract enforcement and the presence of production networks within RTAs may also contribute to more resilient trade. When their supply is disrupted, firms may become more selective with regard to which contract to fulfil and which to forfeit. Deep RTAs' enforcement rules may make the forfeiting of contracts more costly, thus trade within these agreements could have been more robust. Moreover, RTAs often entail the presence of production networks between domestic and foreign firms, which result in lower bilateral trade volatility (Cattaneo *et al.* 2010). Finally, trade agreements are often formed between countries having a history of economic cooperation which contributes to mutual trust and reliance among their firms (Fernández and Portes, 1998). Consequently, supply disruptions during the COVID-19 pandemic may then have favoured the more established trade relationships.

To analyse whether intra-RTA trade has been more resilient during the COVID-19 pandemic, this paper examines bilateral trade flows of 139 countries. The method of analysis consists of a simple econometric model where fixed effects control for importers' and exporters' characteristics and for the idiosyncratic shocks and policy responses related to the COVID-19 pandemic.

Overall, this paper finds evidence that bilateral trade taking place within RTAs was relatively more resilient against the global trade collapse of 2020. When we further differentiate between shallow and deep integrations, we find that deep RTAs have provided relatively better stability against the

---

[1] Liu *et al.* 2021; Espitia *et al.* 2021; Baldwin and Tomiura, 2020; Evenett *et al.* 2020.

[2] Regional trade agreements are defined as reciprocal preferential trade agreements between two or more partners. See https://www.wto.org/english/tratop_e/region_e/region_e.htm for more details.

[3] These arguments also explain why RTAs are found to have general positive effects on bilateral trade flows. See for example Carrere, 2006; Baier and Bergstrand, 2007; Maggi, 2014; and Anderson and Yotov, 2016.

global shock. Importantly, the results show some heterogeneity across developing and developed countries as well as across developing countries' regions.

The structure of the paper is as follows. Section 2 briefly describes the data utilized for the analysis. Section 3 provides some preliminary statistics on trade flows during the COVID-19 pandemic. Section 4 presents the empirical method and the estimation results. The final section discusses the policy implications of the results and concludes.

2. Data

The data utilized in this paper is comprised of trade data, regional trade agreements identifiers, and gravity type variables. Trade growth rates are constructed by using monthly bilateral trade flow data from the UNCTAD's Global Trade Update database.[4] The CEPII database provides gravity type variables such as distance and contiguity.[5] The variable that identifies regional trade agreements by type is from CEPII, which uses original data from the WTO. The analysis differentiates between deep and shallow agreements. Customs union and free trade agreements which include an economic integration agreement are classified as deep agreements. Agreements identified by CEPII as economic integration agreements, free trade agreements and preferential trade agreements are classified as shallow. Finally, UNCTAD definitions were used to construct regional and country groupings by development status.

The data for this study comprises bilateral trade flow data for 139 countries. European Union member states treated as one entity to avoid possible bias in the results due to the European Union countries' high degree of economic integration. The majority of the analysis uses data for 2019 and 2020, while some of the estimations utilize data since 2008.

Trade data is measured with a degree of error. While the Global Trade Update database goes to great lengths to verify the original data by comparing different sources and avoiding inconsistencies between import and export statistics, the data still presents a significant number of outliers which become evident when growth rates are computed.[6] To minimize the impact of outliers in the analysis we follow a standard procedure of trimming the top and bottom 2.5 per cent of the distribution of growth rates. This drops about 1,000 observations out of about 19,200 original data points. Our final dataset consists of 18,216 observations.

---

[4] The database uses national and international data sources such as the IMF's DOT, the International Trade Centre, Eurostat, Thomson Reuters and China Customs to compute its monthly trade matrix. https://unctad.org/topic/trade-analysis/data-statistics-and-trends
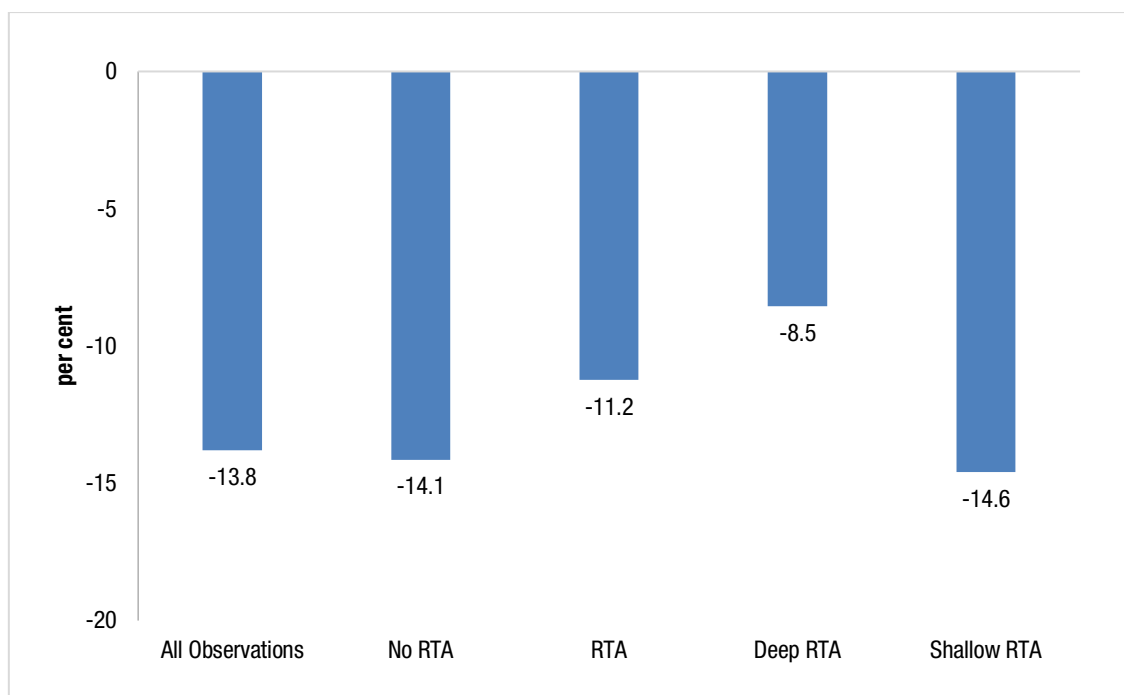
[5] http://www.cepii.fr/CEPII/en/bdd_modele/bdd.asp

[6] Overall, the original data contains 19,200 observations with an upper bound of about 454 million per cent. These large values are mainly marginal trade flows of small economies. The extreme values pull the average trade growth rate to about 3000 per cent, skewness to 144 and kurtosis to 221221. By dropping 5 per cent of observations from both the upper and lower ends of the distribution (about 1000 observations) the average growth rate, skewness, and kurtosis statistics were lowered to -14 per cent, 0.2 and 5 respectively. As we have shown in the robustness section, further trimming the dependent variable does not change the main results while keeping the outliers produces biased results.

3. International trade during the COVID-19 pandemic

The COVID-19 pandemic resulted in a substantial drop in international trade. While global trade declined by about 7 per cent, at the bilateral level trade declines show substantial variance. The decline for an average country was about 14 per cent.[7] However, when trade under an RTA is considered, the decline is about 11 per cent. In other words, trade under an RTA was more resilient by almost three percentage points relative to trade between the countries that do not have any trade agreement (Figure 1).

The argument of trade being relatively more resilient when trade costs are lower is also supported by further differentiating between types of RTAs. [8] Trade under deep trade agreements is substantially more resilient than trade under shallow agreements. On average trade between members of a deep RTA fell by about 6 percentage points less than a shallow RTA.

## Figure 1. Average export growth by RTA (2020)

Source: Authors' calucations based on UNCTAD Global Trade Update database.

While these results are telling, the difference could be due to diverse effects (and responses) of COVID-19 between developed and developing countries. However, figure 2 shows that for both developed and developing countries, trade under RTAs has been more resilient, by two percentage points for developing countries and by three percentage points for developed countries. However, these effects are only because of lower declines for trade under deep RTAs, trade under shallow RTA slightly worse than trade under no-RTA, at least on average.

---

[7] This statistic is the simple average trade growth across all bilateral trade flows during 2020.

[8] Shallow agreements are these providing only tariff preferences, deep agreements also deal with policies and disciplines necessary to address non-tariff measures and to foster international production sharing.
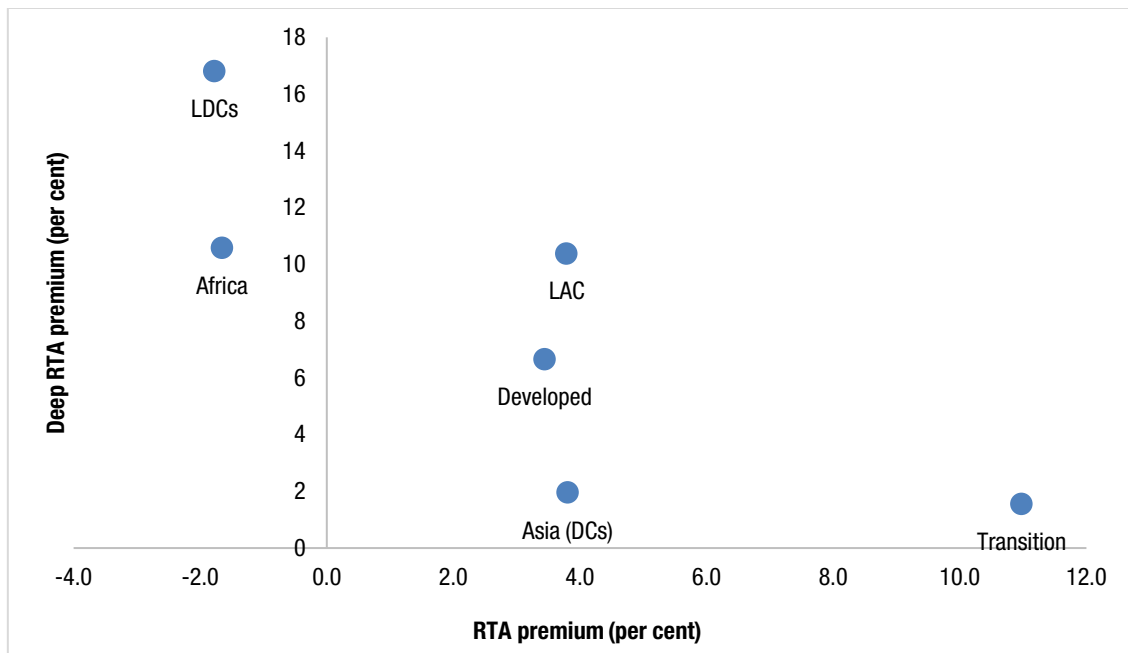
Figure 2. RTA effect by developed and developing countries (2020)
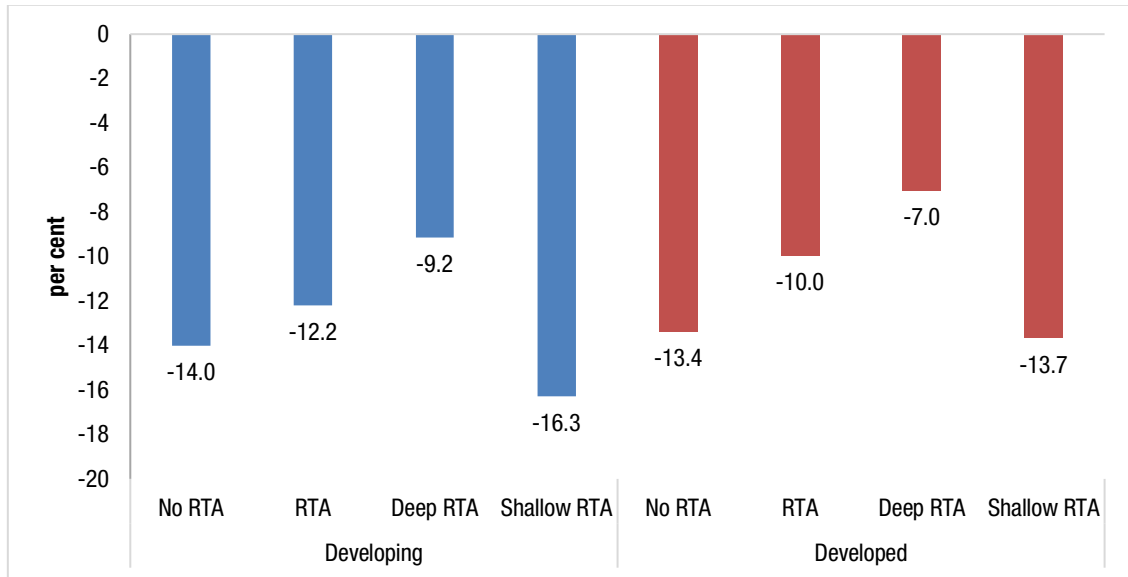
Source: Authors' calculations.

Further differentiating across geographic regions indicates a similar pattern. Figure 3 shows the overall RTA premium (the average bilateral export growth of RTA member states minus the average bilateral export growth of non-RTA member states) and deep RTA premium (average export growth of deep RTA member states minus average export growth of shallow RTA member states).

Figure 3. RTA and deep RTA premiums by region (2020)

Source: Authors' calucations based on UNCTAD Global Trade Update database. Note: Premium is defined as the average bilateral export growth between deep RTA members minus average bilateral export growth of shallow non-RTA member states.

4. Regression analysis

Although informative, the relationship between trade growth and RTAs presented above is primarily for illustrative purposes. To better assess the impact of RTAs on trade resilience, we need to control for other determinants that may affect trade growth. Therefore, this section tests more formally the hypothesis whether trade within RTAs has been more resilient during the COVID-19 pandemic. To do so, we apply a simple cross-section econometric model where a set of fixed effects controls for country specific characteristics. As the variable of interest is bilateral in nature (the presence of an RTA), we cannot employ bilateral fixed effects and instead we rely on gravity variables. In summary, the identification strategy relies on variation of growth rates for trade within RTAs relative to trade subject to no agreement, controlling for importer and exporter specific effects.

The estimating model takes the form:

$$\text{x}_{ij} = \beta_0 + \beta_1 RTAs_{ij} + \sum_{s=1}^{S} \delta_s\, G_{ij}^s + \omega_i + \theta_j + \varepsilon_{ij} \tag{1}$$

In this specification, the dependent variable x_{ij} is the export growth rate from country i to country j. $RTAs_{ij}$ is a dummy variable that takes the value 1 if there is a trade agreement between country i and country j. G_{ij}^s is a set of other gravity variables (distance and contiguity).[9] ω_i and θ_j are exporter and importer country fixed effects, respectively, and ε_{ij} is an error term. The estimation is based on ordinary least squares.

Econometric Results

The results of the benchmark model are presented in table 1. The estimated constant term in this specification gives the average rate of trade growth in the case of no-agreement controlling for country characteristics. The coefficients on the RTAs variables indicate the effect of RTAs on bilateral trade growth relative to the case of no-agreement.

Once controlling for importer and exporter characteristics, we find the trade growth rate of the average country to be about -17 per cent during 2020. More importantly for our analysis, column 1 shows a positive and significant effect of RTAs in making bilateral trade more resilient. The overall effects are quantified as a difference of about 5.6 percentage points compared to the decline in trade between countries without an RTA.

The second column of table 1 shows the results when differentiating between deep and shallow RTAs. The estimation is performed by adding a deep RTA dummy to the initial set of variables. In this specification, the initial RTA variable captures the effect of shallow RTAs and the deep RTA dummy identifies whether deep RTAs add to the general effect. When RTAs are differentiated into two groups, we find that deep RTAs tend to result in even more resilient trade. On average, shallow RTAs mitigated the decline in trade by about 3.2 percentage points, while deep RTAs contributed another 4.6 percentage points for a total of about 7.8 percentage points.

---

[9] Distance and contiguity control for the fact that RTAs are generally among countries that share a common border and/or are geographically close. Additional gravity type variables are omitted for brevity as they generally resulted in insignificant coefficients (e.g. product of GDPs, common religion, colonial links). By including them, the results remain virtually identical.

| Table 1. RTAs and export growth | | | | | |

VARIABLES	(1) All 2020	(2) All 2020	(3) 1st half 2020	(4) 2nd half 2020	(5) Feb 2020 to Sept 2020
RTAs	0.0564***	0.0324**	-0.0028	0.0215	0.0283*
	(0.0108)	(0.0147)	(0.0154)	(0.0158)	(0.0157)
Deep RTAs		0.0455***	0.0461**	0.0572***	0.0380**
		(0.0176)	(0.0181)	(0.0189)	(0.0181)
Distance	0.0025***	0.0027***	0.0031***	0.0006	0.0039***
	(0.0009)	(0.0009)	(0.0009)	(0.0009)	(0.0009)
Contiguity	0.0154	0.0117	-0.0143	0.0146	0.0026
	(0.0198)	(0.0198)	(0.0183)	(0.0212)	(0.0197)
Constant	-0.1690***	-0.1709***	-0.1524***	-0.1249***	-0.2101***
	(0.0394)	(0.0394)	(0.0395)	(0.0407)	(0.0376)
Observations	18,216	18,216	18,216	18,216	18,216
R-squared	0.0829	0.0832	0.0774	0.0858	0.0817

Notes: Robust standard errors in parentheses. *, **, *** denote significance at 10%, 5% and 1% respectively. Estimations include importer and exporter fixed effects.

The analysis, so far, considered the impact of the RTAs for the whole year. Of interest is whether the effect of RTAs in explaining trade resilience has been identical during the COVID-19 crisis. Therefore, we perform the regression analysis on separate periods: the first half of 2020 which was marked by a dramatic drop in trade, and the second half of 2020, when trade declines were more muted. Finally, we further restrict the sample to the most severe period of the trade downturn (from February to September 2020). Columns 3, 4 and 5 of table 1 show the regression results for those different periods. Overall, the result of the importance of deep RTAs in mitigating the trade decline is generally valid, both for the first and second half of 2020, as well as the most severe period of the trade downturn. On the other hand, the coefficients on shallow RTAs lose significance except when considering the most severe period of the trade downturn, where it remains significant at the 10 per cent level.

One extension of the benchmark model is to consider differences in the effects of RTAs between developing and developed countries. Although the spread of the virus and lockdowns lead to economic downturns all over the world, developing and developed countries have different economic and technical capacities to deal with the economic, logistical and health challenges of the pandemic. These differences may also affect the importance of RTAs for a country's trade. Table 2