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The Impact of Regional Trade Agreements on Georgia's Exporters

A Firm-Level Analysis

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Abstract

This paper assesses the trade impact of regional trade agreements signed by Georgia. Using information from the World Bank's Deep Trade Agreements database and the Exporters' Dynamics Database for Georgia for 2000–20, the paper tests the effect of regional trade agreements on the performance of Georgian exporters. The results show that the depth of regional trade agreements has a positive effect on the exports of firms, and the more so if trade agreements include legally enforceable provisions. Interestingly, the effect of regional trade agreements is not homogeneous across exporters with different characteristics. While large exporters and firms participating in global value chains benefit from deep trade agreements, small firms are negatively affected. Deep trade agreements have a positive effect on the probability of entry into the export market for large firms and firms in global value chains.

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The Impact of Regional Trade Agreements on Georgia's Exporters: A Firm-Level Analysis*

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1 Introduction

Between 1994 and 2018, Georgia has signed 11 regional trade agreements (RTAs). These agreements have evolved in several directions. First, the range and the type of preferential partners has changed considerably. While early agreements were signed mostly with countries in the region (i.e. the Commonwealth of Independent States in 2003 and Georgia-Turkey in 2006), in more recent years Georgia signed trade agreements with the EU (2016), with European Free Trade Area (EFTA) countries (2017), and with China (2018). Second, the depth of commitments in RTAs has changed over time. The early agreements of Georgia covered few policy areas focusing on reducing border barriers to trade. More recent trade agreements, most notably with the EU, are substantially deeper as they include provisions covering many more policy areas beyond border measures, such as investment, competition and intellectual property rights protection.

How did Georgia's RTAs impact the performance of its exporters? What policy areas covered by Georgia's trade agreements contributed the most to boost Georgian exports? How were different sectors and types of firms affected by Georgia's RTAs? This paper uses firm level export data for Georgian firms over the period 2000-2020 and detailed information on the content of trade agreements from the World Bank (Hofmann, Osnago, and Ruta, 2017) to test the effect of "deep" RTAs on the export performance of Georgian firms. The analysis relies on a structural gravity model for trade, which allows to identify the impact of trade agreements—and of specific policy areas included in RTAs—on exports while controlling for other determinants of trade flows.

Several results emerge from this exercise. Georgia's deep RTAs have been overall successful in boosting trade. The analysis shows that a 10% increase in the depth of trade agreements implies a 0.5% increase in the value exported by the average Georgian firm. Such a positive effect is however heterogeneous across different types of provisions. It appears to be largely driven by a set of "core" provisions in RTAs including areas covered by the WTO mandate, such as tariff liberalization and services trade opening, as well as policy areas that improve the business climate, such as competition policy, investment and intellectual property rights protection (Mattoo, Mulabdic, and Ruta, 2017). Conversely, RTA provisions on policy areas weakly connected to trade (referred to as WTO-X provisions, see Horn, Mavroidis, and Sapir (2010)) have a slight or null effect on the exports of Georgian firms. See table 1 for a detailed description of RTA provisions groups used in this paper.

The average positive impact of Georgia's RTAs on exports hides important heterogeneous effects across different types of firms, with some firms gaining and other losing. Results indicate that large firms and firms integrated into global value chains (GVC firms—i.e. those that import and export) benefit the most from deep RTAs: a 10% increase in the depth of trade agreements implies 1.1% increase in the export of large firms. Small firms are penalized by the stronger competition from large firms: a 10% increase in the depth of trade agreements implies a 1.2% reduction in the export of small firms.

The analysis also shows interesting heterogeneity of the depth of Georgia's RTAs across sectors and products of different quality. Georgia's RTAs have promoted the exports of firms in the agriculture sector but had limited success so far in boosting exports of firms in the manufacturing sector (only small firms in a selected number of manufacturing sectors are found to benefit from deep RTAs). Interestingly, the depth of Georgia's RTAs favor in particular the exports of firms producing low-quality products. More reassuringly, the depth of RTAs has also a small but positive effect on the export participation of firms (i.e. the extensive margin) and on the probability of starting to export into a new destination.

The rest of the paper is organized as follows. Section 2 discusses the data used in the analysis and proposes some descriptive evidence. The empirical strategy and the main regression results are presented in Sections 3 and 4, respectively. Concluding remarks follow.

Table 1: Groups of RTAs provisions.

Group	RTA Provision
WTO+	Tariffs industrial goods; Tariff agricultural goods; Customs Administration; Export Taxes; SPS Measures; State Trading Enterprises; Technical Barriers to Trade; Countervailing Measures; Antidumping; State Aid; Public Procurement; TRIMS Measures; GATS; TRIPs.
WTO-X	Anti-Corruption; Health;Competition Policy; Human Rights; Environmental Laws; Illegal Immigration; IPR; Illicit Drugs; Investment Measures; Industrial Cooperation; Labour Market Regulation; Information Society; Movement of Capital; Mining; Consumer Protection; Money Laundering; Data Protection; Nuclear Safety; Agriculture; Political Dialogue; Approximation of Legislation; Public Administration; Audiovisual; Regional Cooperation; Civil Protection; Research and Technology; Innovation Policies; SMEs; Cultural Cooperation Social Matters; Economic Policy Dialogue; Statistics; Education and Training; Taxation; Energy; Terrorism; Financial Assistance; Visa and Asylum.
Core	Tariffs industrial goods; Tariff agricultural goods; Customs Administration; Export Taxes; SPS Measures; State Trading Enterprises; Technical Barriers to Trade; Countervailing Measures; Antidumping; State Aid; Public Procurement; TRIMS Measures; GATS; TRIPs; Investment Measures; Movement of Capital; IPR; Competition Policy.

Note: The definition WTO+ and WTO-X groups follows Horn et al. (2010). The definition of "core" provisions follows Mattoo et al. (2017).

2 Data and descriptive evidence

Our empirical analysis uses two main data sources from the World Bank: (i) the Exporter Dynamics Database (Fernandes, Freund, and Pierola, 2016) providing Georgian firm level exports in the period 2000-2020, and (ii) the Content of Deep Trade Agreements (Hofmann et al., 2017) on the content of 11 active RTAs that Georgia has signed over the last 30 years (and in force over the period 2000-2020). Moreover, we complete our data with the gravity

database from the CEPII for destination countries' distances from Georgia, and with the MacMap (CEPII) database on the tariff faced by Georgian exporters at destination.

The Exporter Dynamics Database (EDD) provides information on the export of Georgian firms over the period 2000-2020. The EDD includes export records at the firm, product (HS 6-digit classification) and market level for the universe of Georgian exporters. All non-service sectors are covered in this report. We exclude only sector HS 87 ("Vehicles other than railway or tramway rolling stock, and parts and accessories thereof"), considered as an outlier because of the abnormal growth in the number of exporting firms showed in figure A1.[1] The exports of a given firm can be tracked over time thanks to a firm identifier. Beyond their high quality (and reduced measurement error concern), individual exporter data has the main advantage of allowing empirical investigations of the effect of regional trade agreements on firms depending on their size and other observable characteristics such as the firm's participation in global value chains.

The Content of Deep Trade Agreement database contains information on the specific provisions included in more than three-hundred active regional trade agreements, and in particular on the 11 trade agreements that Georgia has in force over the period 2000-2020. In Table 2 we show the list of RTAs that Georgia singed over the period covered in this paper. Note that Georgia has preferential trade relationships with neighboring countries such as CIS partners. In more recent years, the country has also negotiated new agreements with large partners outside the region, most notably Georgia-EU in 2014, Georgia-EFTA in 2017 and Georgia-China in 2018.

This section shows preliminary descriptive evidence on the depth of Georgian RTAs, on the average export performance of Georgian firms, and on how deep RTAs and firms' exports correlate. This prima facie evidence provides motivation for a careful econometric analysis (developed in the second part of the paper). After a first look and the average depth of Georgian RTAs (in figure 1) in the period 2000-2020, we present a first set of graphs (in figures 2, 3, and 4) in which we relate the total exports and imports of Georgian firms with the number of signed regional trade agreements over time. In all graphs, the red line represents the number of RTAs. Although there is little variation over time in the number of signed RTAs (only four RTAs have been signed over the considered period, and one became inactive), the figures show an interesting co-movement between exports and the number of RTAs. As detailed in Table 2, there is also interesting variation in the type of Georgia's RTAs: there is a diversity in the type of partners (neighbor low-income as well as more distant high-income partners), in the size of such agreement (multilateral and bilateral agreements), and a strong heterogeneity in terms of RTAs depth.[2] For example,

[1] This abnormal pattern is due to used cars that Georgia imported from countries like Japan, the United States and Germany and re-exported to neighboring countries (mostly Azerbaijan, Armenia, and Kazakhstan). As WTO (2015) notes the re-export of used cars declined in 2014 because of the more stringent requirements on used cars introduced by Azerbaijan.

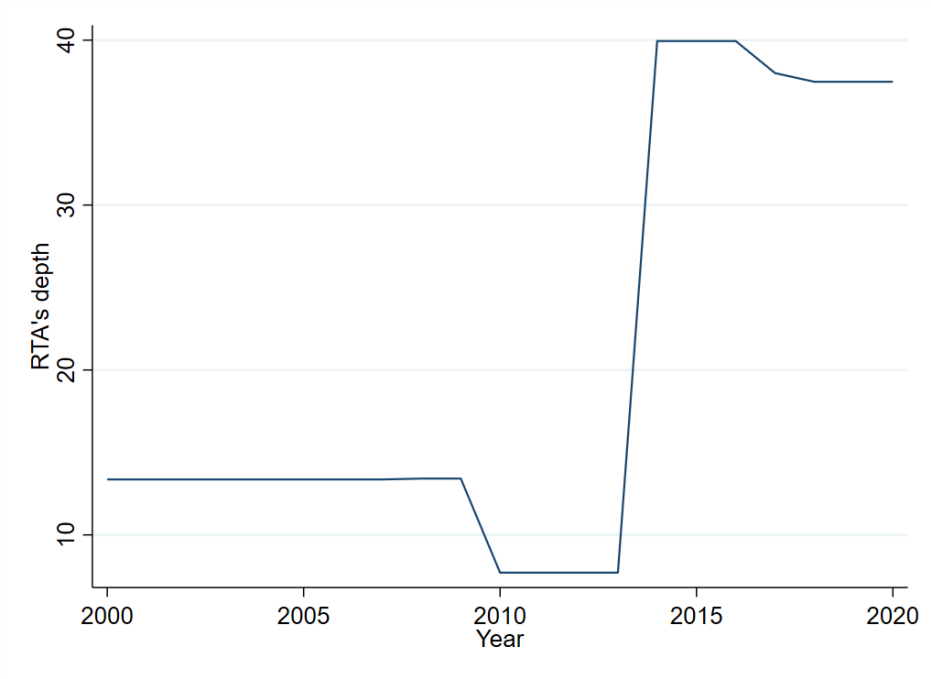
[2] RTA depth is measured by the number of areas covered by the agreement, such as technical barriers to trade (TBT), investment, competition, among others.

the Georgia-Russian Federation RTA shows a depth of 8 policy areas covered, while the Georgia-EU RTA goes up to 48 areas covered. The pattern of average depth of Georgian RTAs over time, reported in Figure 1, has evolved in recent years. The first shock is in 2009, when Georgia left the Commonwealth of Independent States (CIS). At that time, CIS was for Georgia one of the deepest agreements and included the greatest number of partners. The second shock happened with the signature of the RTA with the EU in 2014, which is characterized by the highest level of depth and number of partners. See Table 2 for the depth of each active Georgian RTA.

Table 2: Georgia's Trade agreements.

Name	Partners	Years	# of policy area covered
Common wealth of Independent States	Armenia; Azerbaijan; Belarus; Kazakhstan; Kyrgyzstan; Moldova; Russia; Tajikistan; Uzbekistan; Turkmenistan(associate)	1994-2009	12
Georgia-Russian Feder.	Russia	1994-...	8
Georgia-Azerbaijan	Azerbaijan	1996-...	7
Georgia-Armenia	Armenia	1998-...	6
Georgia-Kazakhstan	Azerbaijan	1999-...	6
Georgia-Ukraine	Ukraine	1996-...	7
Georgia-Turkmenistan	Turkmenistan	2000-...	6
Turkey-Georgia	Turkey	2008-...	14
EU - Georgia	European Union	2014-...	48
Georgia-EFTA	Iceland; Lichtenstein; Norway; Switzerland	2017-...	21
Georgia-China	China	2018-...	17

Figure 1: Depth of Georgian RTAs over time

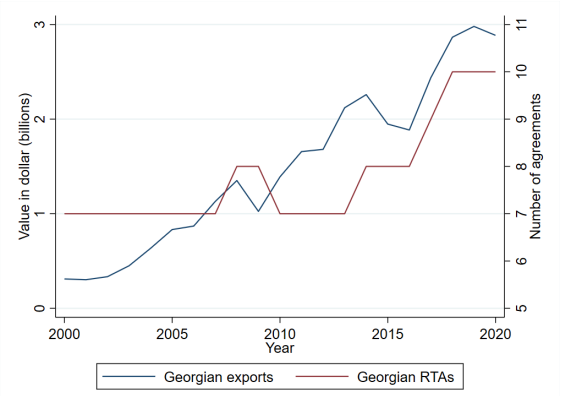


The two first sets of graphs (cf. Figures 2 and 3) focus on exports. Panel (a) of Figure 2 reports the time-evolution of the Georgian aggregate exports (in USD), showing a strong increase with some fluctuations in the period 2012-2015. Panels (b), (c), and (d) disentangle the pattern of aggregate export by firm size.[3] Panel (b) shows the exports' evolution for small firms (i.e. bottom quartile in size distribution), Panel (c) shows aggregate export of middle-sized firms (i.e. firms with size between 25th and 75th percentile), and Panel (d) shows aggregate export for large firms (i.e. top quartile in size distribution). As we can see, large firms' exports represent the majority of the aggregate exports and drive its variation over time. Yet, small and middle-size firms experience a progressive growth too. All panels show a positive correlation between firms' exports and number of RTAs.

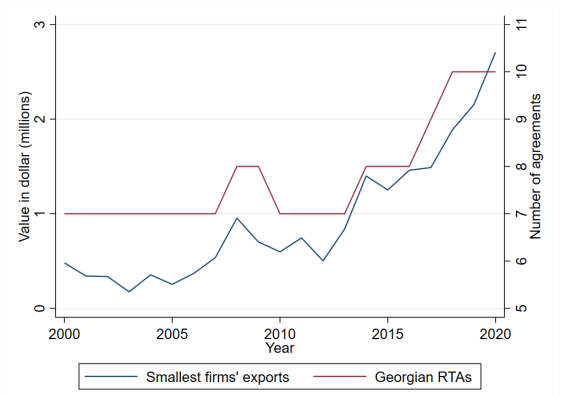
In Figure 3 we run some stratification sample exercises to further detail the characteristics of Georgian exporters. Panel (a) of Figure 3 describes the evolution over time of exports for GVC firms (i.e. firms that export and import at the same time). GVC firms show important growth over time, although in level they represent only a small share of total Georgian exports (GVC firms are a minority of exporters). Panels (b) and (c) divide exports between the agricultural (millions of USD on the vertical axis) and manufacturing sectors (billions of USD on the vertical axis). This distinction shows that the manufacturing sector drives the aggregate exports representation (cf. Panel (a) Figure 2). Then, Panel (d) provides the exports over time in quantity. The unclear pattern reveals some measurement error issue that motivate our focus on export values in the rest of the paper. To complete the description of Georgian trade relations, Figure 4 presents the evolution of Georgian imports over time in value and quantity. Both figures increase over time. Panel (a) shows similar fluctuation as aggregate exports (cf. Panel (a) Figure 2).

[3]Firm's size is measured by its average value of total exports over the period.

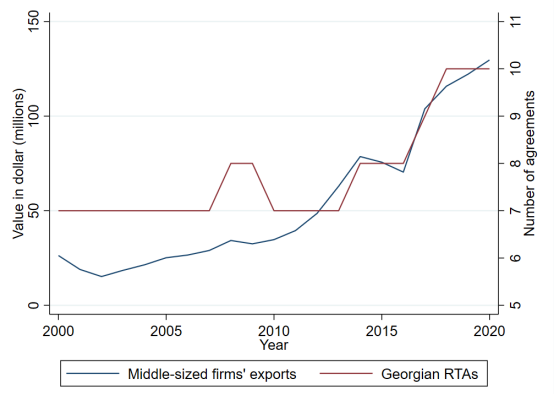
Figure 2: Georgian exports and RTAs.



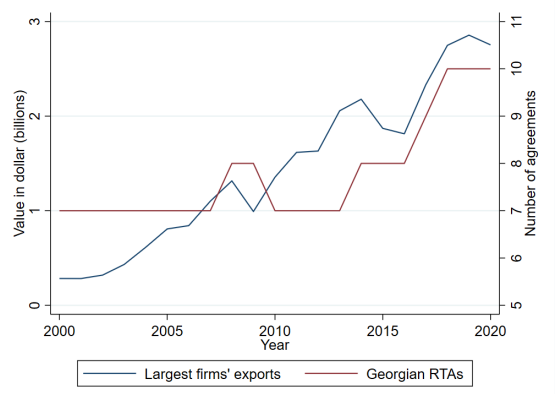
(a) Georgian exports: Total



(b) Georgian exports: small firms

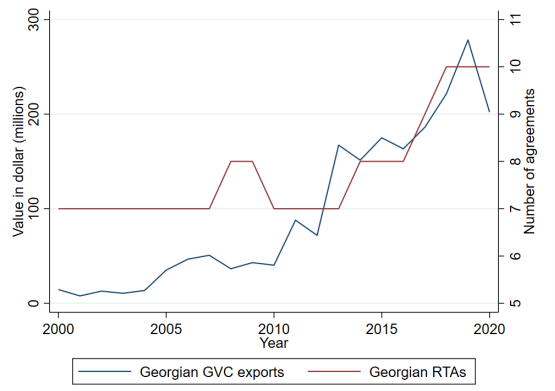


(c) Georgian exports: middle size firms

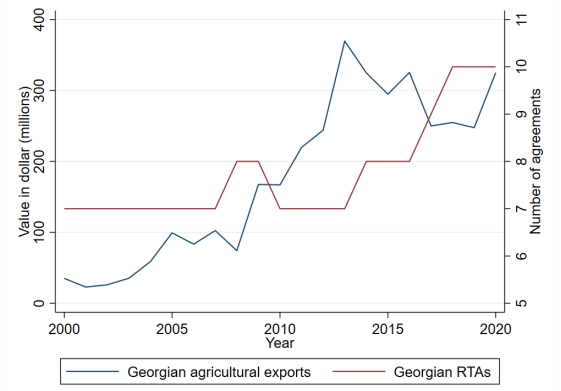


(d) Georgian exports: large firms

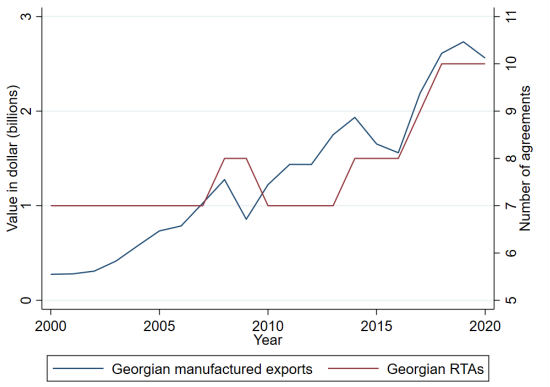
Figure 3: Georgian exports and RTAs. Stratification by GVC firms and sector.



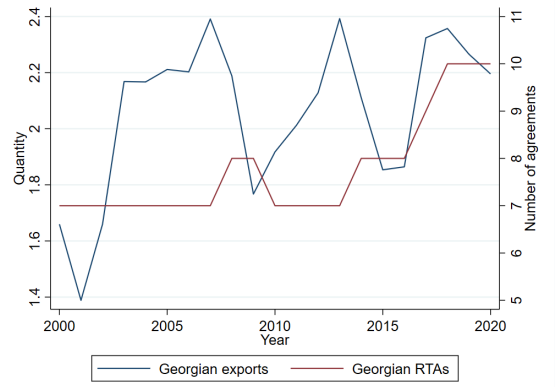
(a) Georgian exports: GVC firms



(b) Georgian exports: agriculture



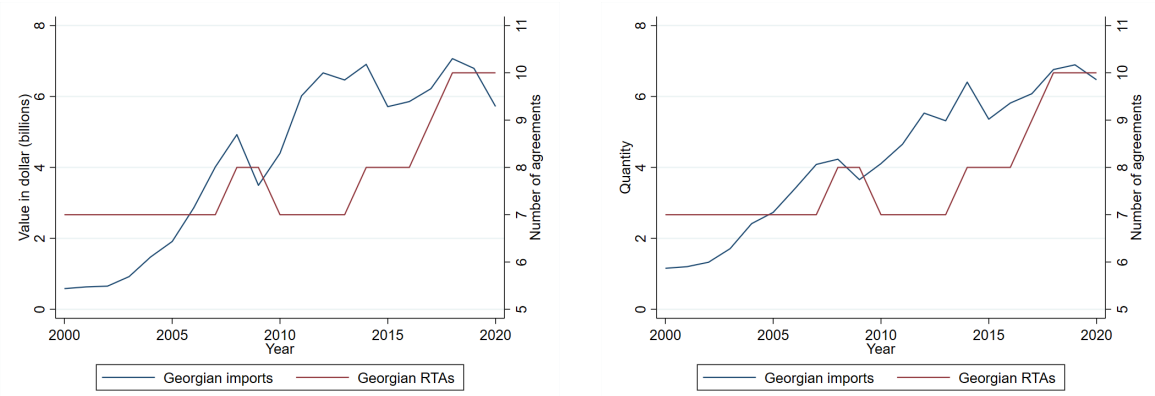
(c) Georgian exports: Manufacture



(d) Georgian exports: quantity

In Tables 3 and 4, we provide sample descriptive evidence (i.e. mean, median, maximum, minimum) for firms' exports and imports in the years 2000-2020. The table shows once again an accelerating growth of export value over time but with a strong dispersion between firms. Some firms trade a lot and account for a large majority of the aggregate figures (the so called "export superstars" phenomenon as in Bernard, Jensen, Redding, and Schott (2007)) while others export or import really small values. The same figures emerge if we use the number of average destinations served (Table 5) and products exported (cf. Table 6) per firm.

Figure 4: Georgian imports and RTAs.



(a) Georgian imports: value

(b) Georgian imports: quantity

Table 3: Exports value by exporting firm.

Year	Mean (thousands)	Maximum (millions)	Minimum (units)	Median (thousands)
2000	176.1	14.7	2	14.3
2005	475	86	1.5	18.9
2010	750	207.8	1	22.5
2015	816.2	208.4	0.1	23.6
2020	965.9	646.1	1	32.4

Table 4: Imports value by importing firm.

Year	Mean (thousands)	Maximum (millions)	Minimum (units)	Median (thousands)
2000	102	22.9	24.4	4.9
2005	239.5	74.4	8.1	15.3
2010	264.5	303.2	0.5	12.8
2015	270	141.1	7.2	14.3
2020	301.4	113.2	1.2	17.9

Table 5: Number of partner by exporting/importing firm.

Year	Destinations (mean)	Destinations (max)	Origins (mean)	Origins (max)
2000	1.42	16	1.44	27
2005	1.53	32	1.64	55
2010	1.77	33	1.64	54
2015	1.73	27	1.64	39
2020	1.87	31	1.75	52

Table 6: Number of traded products by firm (hs6).

Year	Exp. mean	Exp. max	Imp. mean	Imp. max
2000	2.3	93	5.8	270
2005	2.7	225	11.4	807
2010	4.4	269	13.1	1907
2015	6.1	212	12.9	774
2020	6.7	600	12.6	704

While Georgia's main export products have not changed substantially since 2000 (see Table 8), the top trade-partners evolved considerably. China and the US entered in the list of top-10 destinations between 2000 and 2020, in part at the expenses of some EU countries like Germany and Italy. As expected, Russia represents the lion's share of Georgian exports with a value of USD 428 million exported in 2020 (cf. Table 7). If we take the EU as a whole, it represents the main export destination for Georgia (with an exports value of USD 685 billion in 2020). This suggests the crucial role of the Georgia-EU agreement signed in 2014. Interestingly, in terms of export shares, while Russia experienced between 2000 and 2020 a decrease of almost 7 percentage points, the EU maintained its position attracting around 24% of Georgian exports. Also, China represents in 2020 the first destination (second if one considers the EU as an aggregate) with 16% of the Georgian exports.

Table 7: Top destinations.

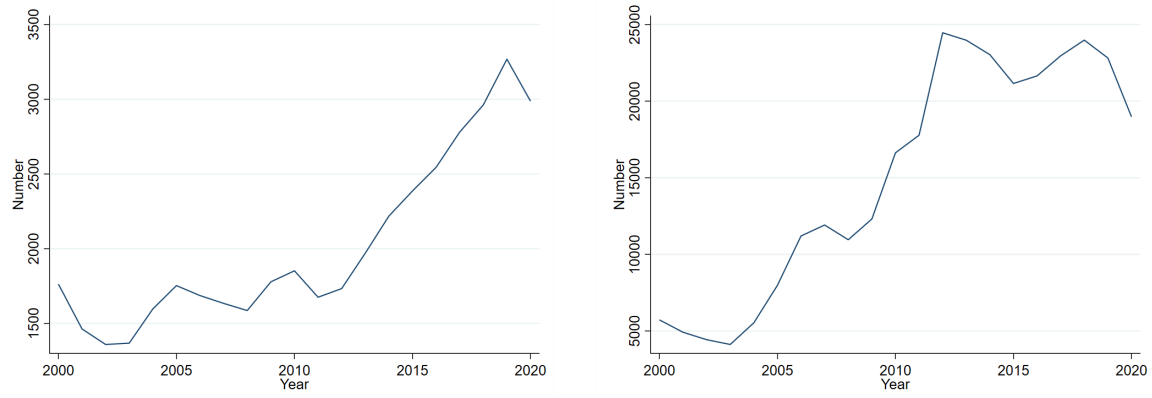
Rang	2000-Country	2000-Value (millions)	2000-Exp. share	2020-Country	2020-Value (millions)	2020-Exp. share
1	Turkey	67.3	21.7%	China	476.2	16.5%
2	Russian Fed.	66.3	21.4%	Russian Fed.	428.4	14.8%
3	Germany	31.4	10.1%	Bulgaria	311.6	10.7%
4	Azerbaijan	20	6.4%	Azerbaijan	198.3	6.8%
5	Armenia	13.5	4.4%	Turkey	182.2	6.3%
6	Switzerland	13.4	4.3%	Armenia	170.1	5.8%
7	Italy	11.8	3.8%	Ukraine	135.8	4.7%
8	Ukraine	10.6	3.4%	Switzerland	104.3	3.6%
9	Turkmenistan	10.6	3.4%	Spain	83.6	2.9%
10	Great Britain	10.2	3.3%	United States	78.8	2.7%

Table 8: Top exported sectors.

Rang	2000-Product (HS2)	2000-Value (millions)	2000-Exp. share %	2020-Product (HS2)	2020-Value (millions)	2020-Exp. share %
1	Iron & steel (72)	53.4	17.1	Ores, slag and ash (26)	822.6	28.4
2	Beverage & spirits (22)	46.9	15.0	Beverage & spirits (22)	498.1	17.2
3	Ores, slag & ash (26)	29.8	9.5	Iron & steel (72)	273.8	9.4
4	Fruits & nuts (08)	22.3	7.1	Fruits & nuts (08)	171.8	5.9
5	Mineral fuels & oils (27)	20.4	6.5	Prec. stones & metals (71)	116.2	4
6	Machinery (84)	18.7	6.0	Pharmaceutical (30)	110.1	3.7
7	Aluminum (76)	17.6	5.6	Fertilizers (31)	72.5	2.5
8	Fertilizers (31)	16.2	5.2	Apparel & clothing acces. (61)	66.6	2.3
9	Aircraft, spacecraft (88)	11.2	3.6	Animals	50.7	1.7
10	Wood & article of (44)	7.5	2.4	Machinery (84)	48	1.7

Figure 5 presents the evolution over time in the number of exporting and importing firms (Panel (a) and (b), respectively). There is a strong increase over time, starting in 2014 for exports, when Georgia signed an RTA with the EU. For imports, we observe a strong surge followed by fluctuation since 2010 when Georgia left the agreement with CIS countries. To investigate the determinants of this pattern, in Figure 6 we show the time-variation of exports toward ex-USSR destinations (blue/dash line) and non-ex-USSR destinations (green/continuous line). The sensibility to shocks, especially after 2014, appears to be driven by trade with former USSR countries, while the number of exporters to non-ex-USSR partners shows a rather stable growth that correlates with the number of RTAs signed by Georgia (see red and green lines in Figure 6). This evidence thus suggests that exports of Georgian firms were stimulated the most by the entry into force of the RTAs with non-ex-USSR countries.

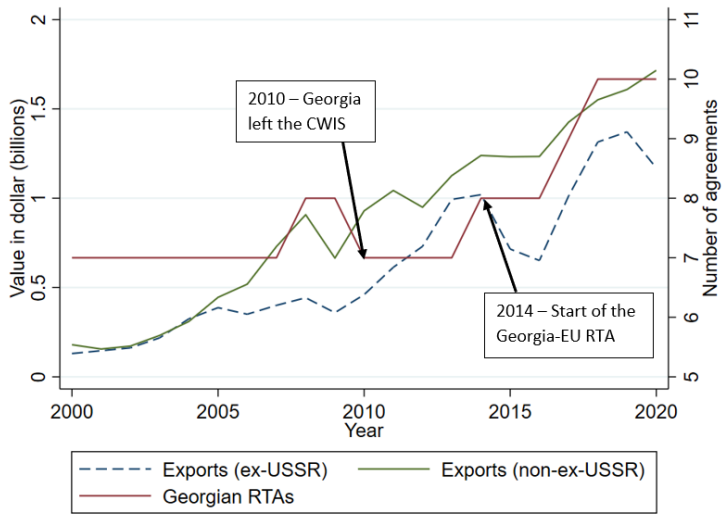
Figure 5: Number of Georgian trading firms.



(a) Number of Georgian exporting firms

(b) Number of Georgian importing firms

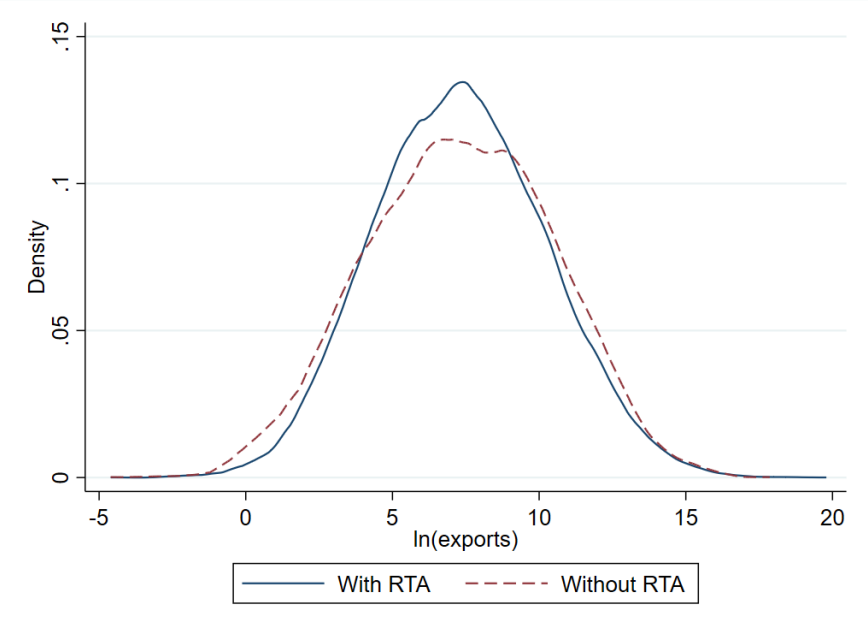
Figure 6: Exports value, ex-USSR destinations vs others.



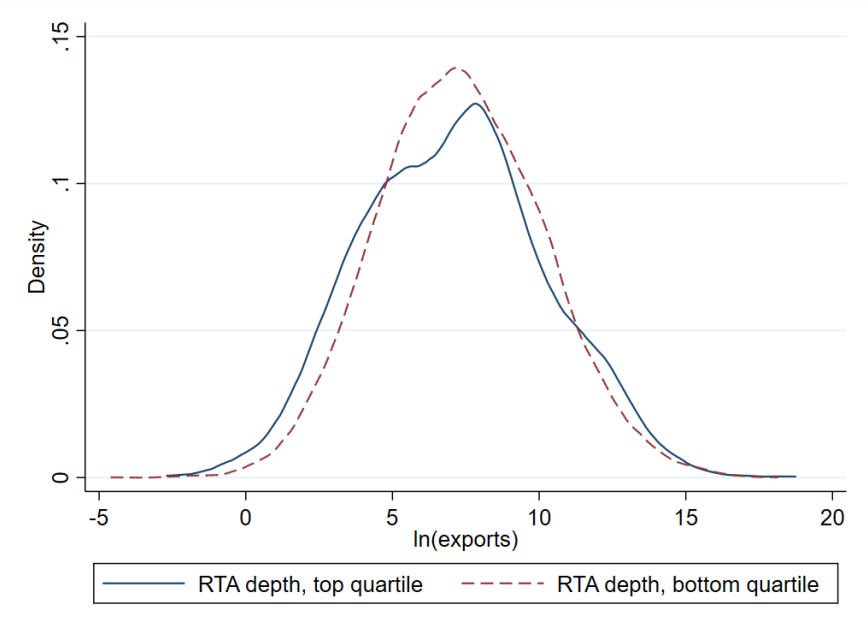
Finally, in Figure 7 we provide two kernel density graphs to have *prima facie* evidence

of the relationship between trade and RTAs. To have more readable curves the figures show the exports in logs. In Panel (a), the solid line represents the distribution of firms' exports towards destinations having an RTA with Georgia, while the dashed line captures firms' export towards countries that do not have an RTA with Georgia. In Panel (b) the figure compares the distribution of firms' exports depending on the depth of the RTAs. The dashed line captures trade flows towards partners that have signed shallow RTAs with Georgia (i.e. RTAs with 14 or less policy areas covered), while the solid line represents trade towards partners that have signed deep RTAs with Georgia (i.e. with 48 or more policy areas covered). Figure 7 indicates that RTAs and deep RTAs signed by Georgia do not have a strong impact on Georgian exports. While this evidence is suggestive, many confounding factors could hide the true impact of Georgian RTAs on trade. For this reason, in the next section we investigate this relationship more formally using a gravity model for trade.

Figure 7: Georgian exports' density (2020).



(a) Density: Total



(b) Density: RTA depth

3 Empirical strategy

In this section we discuss the empirical approach and the identification strategy used to test the effect of deep RTAs on the exports of Georgian firms. Our basic specification is as follows:

$$y_{ikdt} = \beta_1 ln\left(\text{Deep RTA}\right)_{dt} + \beta_2 ln\left(tariff + 1\right)_{kdt} + \mathbb{X}_{dt} + \phi_{it} + \phi_k + \varepsilon_{ikdt} \quad (1)$$

where the subscripts i, s, d and t stand respectively for firm, product (6 digit HS classification), destination and year. The main explanatory variable of interest is the depth of the RTA (if any) that Georgia has with destination d at time t. As a first, coarse measure of RTA depth we use the count of any type of provisions included in the RTA (i.e. horizontal depth). This measure is then refined and we use the count of WTO+, WTO-X and "core" provisions in the RTA.[4] The main empirical challenge here is the impossibility to include in the same specification an RTA dummy (equal to one if Georgia has an RTA in force with destination d), controlling for the preferential market access in d, and its level of depth. These two variables are highly correlated and the estimation would suffer important collinearity problem. To address this potential omitted variable problem, we control for tariffs (effectively applied) faced by Georgian firms in exporting product k at destination d ($ln\left(tariff + 1\right)_{kdt}$). Tariffs will capture any preferential market access effect and allow the Depth of RTA variable to capture any trade effect of RTAs that goes beyond a standard market access channel. The set of destination-year controls $\mathbb{X}_{dt}$ includes: (i) the log of GDP at destination controlling for any income effect (i.e. expenditure in d), and (ii) the log of geographic distance from Georgia to destination d controlling for transport costs.

The firm-year fixed effects (ϕ_{it}) control for any unobserved time varying firm characteristics, such as productivity shocks, change in firm's employment size and composition. Product fixed effects (ϕ_k) control for any product-specificity in Georgian exports (i.e. structure of comparative advantage). These sets of fixed effects, along with the inclusion of controls for demand shocks and transport costs considerably reduce the omitted variable concern and therefore any endogeneity bias.[5]

The main dependent variable y_{ikdt} is the log of exports of firm f of a product k in destination d and time t. However, since the presence of deep trade agreement may also affect the probability to participate to the export market, as well as the probability of starting exporting to d, we squared the database (i.e. assigning zero for each firm not exporting into a given destination-year combination) and estimate equation (1) on: (i) a dummy equal to

[4]WTO+ provisions cover policy areas like tariffs and antidumping duties that are covered by the WTO agreements and where the RTA may confirm the commitments or require deeper commitments. WTO-X provisions cover policy areas not included in the WTO agreements, such as investment, competition policy or corruption. Core provisions are WTO+ provisions and four WTO-X areas: investment, movement of capital, intellectual property right and competition policy.

[5]The possibility that a specific Georgian firm can affect the signature and the content of a specific trade agreement is a remote concern.

one if the firm exports into a given destination, and zero otherwise (participation), and on (ii) a dummy equal to one if the firm starts exporting for the first time in d at time t (first entry probability).[6]

So far, we implicitly assumed that deep RTA affect firms' export homogeneously. However, it can be the case that only large and high-productive firms can benefit from deep RTAs because small firms are not productive enough to export independently of the presence of deep RTA. On the other hand, if less-productive firms are not far from the productivity threshold for exporting, then a new RTA may favor relatively more less productive firms. Whether deep RTA favor relatively more large or small firms remains an empirical question. Similarly, deep RTA may favor relatively more GVC firms because, being firms that import and export at the same time, they may benefit the most by improved business environment at origin/destination. Hence, we study the asymmetric effect of deep RTAs on heterogeneous Georgian exporters by interacting the count of RTA provisions (RTA depth) with three firm's characteristics I_i: (i) firm with size larger than the 75^{th} percentile, (ii) firm with size larger than the 90^{th} percentile, and (ii) GVC firms (i.e. firms with both positive import and export at time t):[7]

$$y_{ikdt} = \beta_1 Ln(\text{Deep RTA})_{dt} + \beta_2 Ln(\text{Deep RTA})_{dt} \times I_i + \beta_3 ln\left(tariff + 1\right)_{kdt} + \mathbb{X}_{dt} + \varepsilon_{ikdt} \quad (2)$$

Alternatively we adopt a binned model (non-parametric approach) in which we interact the deep RTA variable with three firm size bins (indexed by b, standing for large, medium and small) – *binned model* – constructed from percentiles of firms' size distribution:

$$y_{ikdt} = \sum_b \left(\beta_b Ln(\text{Deep RTA})_{dt}) * SizeBin_{ib}\right) + \beta_2 ln\left(tariff + 1\right)_{kdt} + \mathbb{X}_{dt} + \varepsilon_{ikdt} \quad (3)$$

Results on estimations 3 and 2 will provide evidence of the potential heterogeneous impact of deep RTAs on firms with different characteristics. If this is the case, interesting welfare consequences derive. If large firms are relatively more (positively) affected by deep RTAs, the reallocation of workers towards large and high-wage firms will imply an increase in the average wage and a welfare gain for Georgian workers. Large firms pay high wage (Bernard et al., 2007), and if such firms have to expand their production to meet the increased foreign demand, more workers will be employed in large firms, with a consequent increase in the average wage. If the stronger effect for large firms comes at the expenses of small unproductive firms (that suffer competition from larger and more productive firms), the

[6] In order to keep the resulting database manageable, we first collapse export data at the firm-destination-year level (getting rid of the product dimension) and then attach to each firm the set of destinations served by at least one firm in one year. We put zero for those firm-destination-year cells without export data in the EDD.

[7] The size of Georgian firms is approximated by average of total firm's export over the period 2000-2028.

expected welfare gain will be reinforced by a selection effect: workers reallocate from small and low-wage firms to large and high-wage firms.

4 Results

This section discusses the results obtained by estimating equation (1). Results by type of RTA provision (overall vs. legally enforceable) and our baseline results are reported respectively in sections 4.1 and 4.2. Results obtained using equations (3) and (2) are then discussed in section 4.3.

4.1 The importance of legally enforceable provisions

We start by showing baseline results by broad type of provisions, i.e. differentiating by legal enforceable status. Indeed, the Content of Deep trade Agreement database provides information on whether each provision included in RTA is legally enforceable (or not). Table 9 shows results on the depth of RTA variable computed on overall vs legally enforceable provisions. It clearly emerges that legally enforceable provisions have the strongest positive and significant effect on the export of Georgian firms. For this reason, in what follows we focus exclusively on RTA depth measures based on legally enforceable provisions only.

Table 9: Deep RTAs and the export of Georgian firms. The role of legally enforceable provisions.

	Exp (ln)	Exp (ln)	Exp (ln)	Exp (ln)
	(1)	(2)	(3)	(4)
RTA depth	0.027**	0.018		
	(0.013)	(0.014)		
RTA depth (legal)			0.051***	0.046**
			(0.016)	(0.018)
Distance (ln)	-0.237***	-0.232***	-0.226***	-0.220***
	(0.025)	(0.026)	(0.025)	(0.026)
GDP (ln)	0.059***	0.057***	0.058***	0.056***
	(0.012)	(0.012)	(0.012)	(0.012)
Fixed Effects				
Firm	Yes	No	Yes	No
Sector	Yes	Yes	Yes	Yes
Year	Yes	No	Yes	No
Firm-Year	No	Yes	No	Yes
Observations	224,889	213,252	224,889	213,252

Notes: Ordinary least square estimates, destination-year cluster standard errors in parentheses. ***, ** and * indicate statistical significance levels for p-val. < 0.01, p-val. < 0.05, and p-val.< 0.1.

4.2 Baseline estimation results

Table 10 shows the baseline estimation results on the role of deep RTAs on the export value of Georgian firms. In column (1), as a benchmark with the wide literature on the effect of RTAs, we show the effect on Georgian firms' exports of the presence of an RTA with destination d (as captured by a dummy variable). In line with previous studies, we find that the presence of an RTA stimulates the export of the average firm by 27% (see Head and Mayer (2014) for a metadata analysis on the effect of RTAs on export).[8] In columns (2)-(3) we show the effect of the RTA depth (measured by the number of legally enforceable provisions included in the RTA with destination d at time t).[9] Using our preferred specification in column (3) - including firm-by-year fixed effects - a 10% increase in the number of provisions in the RTA implies a 0.46% increase in the export of the average Georgian firm. In column (4) we control for the applied tariff at destination on product k. After controlling for tariffs, the estimation sample reduces (missing tariff data), and the role of RTA depth (although positive in sign) is imprecisely estimated (t-stat 1.43 implying significance at roughly 15%). Control variables for income ad destination (GDP) and geography related export costs (distance) have the expected sign (even if with smaller point estimates with respect to previous literature - Head and Mayer 2014).

In Table 11 we replicate the baseline estimation using legally enforceable WTO+ provisions to calculate the depth of RTAs (in columns 1-2). As expected, trade related legally enforceable provisions, being more likely to be effectively adopted at destination, boost the export of Georgian firms. In columns (3)-(4) we use WTO-X (legally enforceable) provisions to calculate the depth of RTA, while in columns (5)-(6) we show the effect of "Core" provisions. Results show that WTO+ and "Core" provisions have the strongest effect on the export of Georgian firms, while WTO-X have a non-significant effect on the export of Georgian firms. WTO+ and "Core" provisions have almost the same marginal effect: a 10% increase in the number of WTO+ or "Core" provisions stimulated the export of the average Georgian firms by 0.5%.

[8] RTA is a dummy variable so its quantification has been computed as $e^{0.243} - 1$.

[9] In absence of active RTA the RTA depth takes the value of zero.

Table 10: Deep RTAs and the export of Georgian firms.

	Exp (ln)	Exp (ln)	Exp (ln)	Exp (ln)
	(1)	(2)	(3)	(4)
RTA	0.243***			
	(0.043)			
RTA depth (legal)		0.051***	0.046**	0.030
		(0.016)	(0.018)	(0.021)
Ln(tariff+1)				-0.591***
				(0.179)
Population (ln)				
Distance (ln)	-0.187***	-0.226***	-0.220***	-0.257***
	(0.026)	(0.025)	(0.026)	(0.035)
GDP (ln)	0.056***	0.058***	0.056***	0.074***
	(0.012)	(0.012)	(0.012)	(0.016)
Fixed Effects				
Firm	Yes	Yes	No	No
Sector	Yes	Yes	Yes	Yes
Year	Yes	Yes	No	No
Firm-Year	No	No	Yes	Yes
Observations	224,889	224,889	213,252	165,066

Notes: Ordinary least square estimates, destination-year cluster standard errors in parentheses. ***, ** and * indicate statistical significance levels for p-val. < 0.01, p-val. < 0.05, and p-val.< 0.1.

Table 11: The role of legally enforceable, WTO+ , WTO-X and "Core" RTA provisions in affecting the export of Georgian firms.

	Exp (ln)	Exp (ln)	Exp (ln)	Exp (ln)	Exp (ln)	Exp (ln)
	(1)	(2)	(3)	(4)	(5)	(6)
RTA depth (WTO+)	0.049***	0.036*				
	(0.016)	(0.018)				
RTA depth (WTOX)			0.002	-0.025		
			(0.021)	(0.025)		
RTA depth (core provisions)					0.050***	0.038**
					(0.015)	(0.018)
Ln(tariff+1)		-0.581***		-0.645***		-0.575***
		(0.177)		(0.189)		(0.176)
Distance (ln)	-0.214***	-0.251***	-0.239***	-0.275***	-0.211***	-0.248***
	(0.026)	(0.035)	(0.026)	(0.035)	(0.026)	(0.035)
GDP (ln)	0.055***	0.073***	0.058***	0.076***	0.055***	0.072***
	(0.012)	(0.016)	(0.012)	(0.016)	(0.012)	(0.016)
Fixed Effects						
Sector	Yes	Yes	Yes	Yes	Yes	Yes
Firm-Year	Yes	Yes	Yes	Yes	Yes	Yes
Observations	213,252	165,066	213,252	165,066	213,252	165,066

Notes: Ordinary least square estimates, destination-year cluster standard errors in parentheses. ***, ** and * indicate statistical significance levels for p-val. < 0.01, p-val. < 0.05, and p-val.< 0.1.

In Table 12 we test the effect of deep RTA on the export price of Georgian firms (approximated by the export unit values)[10] and on the quantity (Kg) exported. Interestingly, we observe that the export price is not affected by the depth of RTAs, meaning that it does not reduce the variable component of trade costs (iceberg trade costs). Indeed, if the depth of RTA were reducing the variable component of trade costs, this would reflect in a reduction of export price.[11] Therefore, results in column (2) suggest that deep RTAs do not affect the iceberg trade costs, but rather all the other non-iceberg type of trade costs that may hump the export performance of firms. As a further check for this mechanism, in Table 12 we show that the point estimate on export quantities is the same as for export values (confirming the null price effect of deep RTAs).

Table 12: The effect of deep RTAs on the export volume and price of Georgian firms

	Exp Qty (ln)	Exp Tuv (ln)
	(1)	(2)
RTA depth (legal)	0.050**	-0.004
	(0.020)	(0.009)
Distance (ln)	-0.290***	0.071***
	(0.028)	(0.012)
GDP (ln)	0.047***	0.009*
	(0.012)	(0.005)
Fixed Effects		
Sector	Yes	Yes
FirmYear	Yes	Yes
Observations	213,252	213,252

Notes: Ordinary least square estimates, destination-year cluster standard errors in parentheses. ***, ** and * indicate statistical significance levels for p-val. < 0.01, p-val. < 0.05, and p-val.< 0.1.

Finally, we replicate the baseline estimations on the sub-samples of manufacturing and agriculture firms to investigate the effects of RTAs on the two different macro-sectors. Table 13 shows that Georgia's deep RTAs have contributed to boost the exports of firms in the agricultural firms. While the coefficient has the expected positive sign, we do not find any statistically significant impact of deep RTAs on the exports of firms in the manufacturing sector. To dig more into the null effect of deep RTA on manufacturing sectors, in Table 14 we show the effect of deep RTAs on each of the fifteen HS 1-digit headings of the HS classification. These results further confirm the absence of positive effect of deep RTA on manufacturing sectors (with the exception of Mineral Products, Chemicals and Allied Industries where the sign is positive and statistically significant), and the strong positive effect on agriculture firms (largest effect on firms in the Foodstuff sector).

[10]Export Unit Values are calculated as export in values divided by quantity.

[11]The export price is a function of the iceberg trade cost. In this case, a reduction in the variable trade costs would translate in a reduction of the export price.

Table 13: Manufacturing *vs* Agriculture firms.

	Exp (ln)	Exp (ln)	Exp (ln)	Exp (ln)
	(1)	(2)	(3)	(4)
RTA depth (legal)	0.015	-0.023	0.079**	0.068*
	(0.021)	(0.026)	(0.033)	(0.037)
Ln(tariff+1)		-0.710***		-0.524**
		(0.232)		(0.208)
Distance (ln)	-0.182***	-0.188***	-0.324***	-0.461***
	(0.030)	(0.040)	(0.054)	(0.068)
GDP (ln)	0.052***	0.057***	0.071***	0.118***
	(0.013)	(0.017)	(0.021)	(0.026)
Fixed Effects				
Sector	Yes	Yes	Yes	Yes
FirmYear	Yes	Yes	Yes	Yes
Sample	Manuf.	Manuf.	Agri.	Agri.
Observations	166,794	130,939	44,823	32,800

Notes: Ordinary least square estimates, destination-year cluster standard errors in parentheses. ***, ** and * indicate statistical significance levels for p-val. < 0.01, p-val. < 0.05, and p-val.< 0.1.

Table 14: Results by HS 1-digit sector.

	Exp (ln)
	(1)
RTA depth × Animal & Animal Products	-0.052
	(0.063)
RTA depth × Vegetable Products	0.095***
	(0.029)
RTA depth × Foodstuffs	0.136***
	(0.037)
RTA depth × Mineral Products	0.131*
	(0.080)
RTA depth × Chemicals & Allied Industries	0.200***
	(0.042)
RTA depth × Plastics-Rubbers	-0.007
	(0.035)
RTA depth × Raw Hides, Skins, Leather, & Furs	-0.008
	(0.043)
RTA depth × Wood & Wood Products	-0.029
	(0.030)
RTA depth × Textiles	-0.071*
	(0.042)
RTA depth × Footwear & Headgear	-0.006
	(0.047)
RTA depth × Stone & Glass	0.029
	(0.036)
RTA depth × Metals	-0.057**
	(0.025)
RTA depth × Machinery & Electrical	-0.037
	(0.024)
RTA depth × Transportation	0.070
	(0.072)
RTA depth × Miscellaneous	-0.040
	(0.027)
Distance (ln)	-0.219***
	(0.026)
GDP (ln)	0.056***
	(0.012)
Fixed Effects	
Sector	Yes
Firm-Year	Yes
Observations	213,252

Notes: Ordinary least square estimates, destination-year cluster standard errors in parentheses. ***, ** and * indicate statistical significance levels for p-val. < 0.01, p-val. < 0.05, and p-val.< 0.1.

4.3 Firm heterogeneity

The previous results implicitly assumed a homogeneous effect of deep RTA on firms with different characteristics. In this section we test the heterogeneous effect of deep RTAs on firms with different characteristics such as size (here approximated by the firm average export over the entire time span) and GVC participation (here identified by firms that import and export at the same time). In Table 15 we test the heterogeneous effect by interacting the main variable for the depth of RTAs with three characteristics of firms: (i) size above 75^{th} percentile of the distribution, (ii) size above 90^{th} percentile of the distribution and (iii) GVC participation. It clearly emerges that only large and GVC firms benefit from deeper RTAs at destination. Columns (1)-(2) and (4)-(5) show that the effect of deep RTA is entirely driven by large firm with overall average export above the 75^{th} and 90^{th} percentile. Interestingly, columns (3) and (6) of Table 15 show that GVC firms are the firms that actually benefit the most from deep RTAs. The negative coefficient on RTAs depth for small firms (first row in column 4) signals a potential general equilibrium effect. The increased market access granted by deep RTAs implies higher competition abroad and small firms may be penalized. We further explore this potential mechanism by running a bin model, a non-parametric approach where the effect of RTAs is explicitly estimated for three categories of firms: small, medium and large.[12] Results reported in Table 16 confirm our claim. Deep RTAs help the export of large firms at the expenses of small (and less productive) firms, who suffer the competition from large Georgian firms (relatively more favored by deep RTA at destination).

The heterogeneous impact of deep RTAs has an interesting potential consequence on the welfare of Georgian workers. Large and high-wage firms, as a consequence of deep RTAs, have to expand their production to serve (new) foreign markets. Such an extra labor demand is expected to push wages up, attract workers from low-productive firms, and make exporting firms paying higher wage (Bernard et al., 2007). A specific test of this mechanism goes beyond the scope of the present report, and would require firm level data on employment and wages of Georgian firms. However, in presence of constant price (as suggested in Table 12), the heterogeneous effect of RTAs potentially implies a welfare gain for workers *via* an increase in real wages.

[12]Small firms are those with size (i.e. total exports averaged over the period) below the 25^{th} percentile of the distribution, large firms are those with total exports above the 75^{th} percentile of the distribution. Medium firms are those in between.

Table 15: Heterogeneous effect of deep RTAS: big *vs* small firms, and GVC *vs* non-GVC firms.

	Exp (ln)	Exp (ln)	Exp (ln)	Exp (ln)	Exp (ln)	Exp (ln)
	(1)	(2)	(3)	(4)	(5)	(6)
RTA depth (legal)	-0.027	0.011	-0.037	-0.069***	-0.012	-0.047
	(0.021)	(0.020)	(0.030)	(0.024)	(0.023)	(0.032)
RTA depth × Size> 75^{th} pct	0.142***			0.182***		
	(0.031)			(0.035)		
RTA depth × Size> 90^{th} pct		0.136***			0.151***	
		(0.029)			(0.033)	
RTA depth × GVC			0.092***			0.084**
			(0.033)			(0.035)
Ln(tariff+1)				-0.644***	-0.616***	-0.604***
				(0.180)	(0.180)	(0.180)
Distance (ln)	-0.220***	-0.219***	-0.221***	-0.255***	-0.253***	-0.258***
	(0.026)	(0.026)	(0.026)	(0.035)	(0.035)	(0.035)
GDP (ln)	0.057***	0.056***	0.057***	0.074***	0.072***	0.074***
	(0.012)	(0.012)	(0.012)	(0.016)	(0.016)	(0.016)
Fixed Effects						
Sector	Yes	Yes	Yes	Yes	Yes	Yes
Firm-Year	Yes	Yes	Yes	Yes	Yes	Yes
Observations	213,252	213,252	213,252	165,066	165,066	165,066

Notes: Ordinary least square estimates, destination-year cluster standard errors in parentheses. ***, ** and * indicate statistical significance levels for p-val. < 0.01, p-val. < 0.05, and p-val.< 0.1.

Table 16: Heterogeneous effect of deep RTAS: the role of firm size.

	Exp (ln)	Exp (ln)	Exp (ln)	Exp (ln)	Exp (ln)	Exp (ln)
	(1)	(2)	(3)	(4)	(5)	(6)
RTA depth × Big	0.115***	0.113***	0.039	0.003	0.187***	0.188***
	(0.026)	(0.030)	(0.031)	(0.037)	(0.043)	(0.047)
RTA depth × Medium	-0.001	-0.053*	0.011	-0.039	-0.055	-0.123**
	(0.025)	(0.028)	(0.029)	(0.034)	(0.045)	(0.049)
RTA depth × Small	-0.125***	-0.135***	-0.080	-0.082	-0.186***	-0.212***
	(0.043)	(0.050)	(0.053)	(0.072)	(0.068)	(0.074)
Ln(tariff+1)		-0.657***		-0.721***		-0.649***
		(0.182)		(0.232)		(0.218)
Distance (ln)	-0.225***	-0.257***	-0.182***	-0.187***	-0.339***	-0.462***
	(0.026)	(0.035)	(0.030)	(0.040)	(0.053)	(0.067)
GDP (ln)	0.060***	0.075***	0.053***	0.056***	0.082***	0.125***
	(0.012)	(0.016)	(0.013)	(0.017)	(0.021)	(0.026)
Sector	All	All	Manuf.	Manuf.	Agri.	Agri.
Fixed Effects						
Sector	Yes	Yes	Yes	Yes	Yes	Yes
Firm-Year	Yes	Yes	Yes	Yes	Yes	Yes
Observations	213,252	165,066	166,794	130,939	44,823	32,800

Notes: Ordinary least square estimates, destination-year cluster standard errors in parentheses. ***, ** and * indicate statistical significance levels for p-val. < 0.01, p-val. < 0.05, and p-val.< 0.1.

The heterogeneous effect of deep RTAs by firm size may provide an explanation for the null effect of RTAs on manufacturing firms we found in the previous section. Indeed, the null average effect of deep RTAs in Table 13 may hide a strong heterogeneous effect: the positive effect of RTAs on large firms may perfectly offset the negative effect on small firms. To shed light on this potential mechanism, in columns (3)-(6) of Table 15 we estimate the effect of deep RTAs on firms with different size for manufacturing (column 3-4) and agriculture (columns 5-6). Two general conclusions emerge. First, in agriculture sectors large firms gain from deep RTAs at the expenses of small firms. In the manufacturing sector, we obtain once again a null coefficient pointing to a non-significant effect of RTAs. However, the manufacturing macro-sector comprises many heterogeneous sectors, and some of them may still be potentially affected by deep RTAs. In Table 17 we show results from a two-sided binned model and estimate the effect of deep RTAs for large, medium and small firms in each of the fifteen HS 1-digit headings. Given the several combinations of sector and firm size bins, the effect of deep RTA is mixed. However, we are able to spot some manufacturing sectors being positively affected by deep RTAs. Large and medium size firms in the chemical sectors benefit from deep RTAs, similarly small firms in Raw Hides and Skin, Wood and Wood products, Footwear, Stone and Glass sectors benefit from deep RTAs. Interestingly, large firms in many manufacturing sectors seem to suffer the presence of deep RTAs at destination. Such mixed evidence across manufacturing sectors between large and small firms drove the null average coefficient on deep RTA on manufacturing firms and calls for further research on the reasons why Georgia's firms do not appear to gain from deep RTAs in some manufacturing HS 1-digit headings.

Table 17: Two-sided heterogeneity: firms size and sector.

	Exp (ln)		
	Big	Medium	Small
RTA depth × Animal & Animal Products	0.002	0.175	-0.179**
	(0.111)	(0.115)	(0.090)
RTA depth × Vegetable Products	0.188***	0.209***	-0.271***
	(0.031)	(0.056)	(0.070)
RTA depth × Foodstuffs	0.304***	-0.065	-0.420***
	(0.046)	(0.042)	(0.066)
RTA depth × Mineral Products	0.154	0.177	-0.001
	(0.098)	(0.116)	(0.120)
RTA depth × Chemicals & Allied Industries	0.156***	0.350***	0.009
	(0.045)	(0.060)	(0.076)
RTA depth × Plastics-Rubbers	-0.170***	0.079*	0.061
	(0.049)	(0.043)	(0.057)
RTA depth × Raw Hides, Skins, Leather, & Furs	-0.461***	0.017	0.176***
	(0.101)	(0.060)	(0.063)
RTA depth × Wood & Wood Products	-0.175***	-0.061	0.156***
	(0.047)	(0.038)	(0.055)
RTA depth × Textiles	0.072	-0.137***	-0.002
	(0.108)	(0.050)	(0.060)
RTA depth × Footwear & Headgear	-0.111	-0.032	0.130**
	(0.093)	(0.062)	(0.065)
RTA depth × Stone & Glass	-0.216***	0.093**	0.146**
	(0.063)	(0.047)	(0.059)
RTA depth × Metals	-0.080**	-0.055*	0.063
	(0.037)	(0.032)	(0.054)
RTA depth × Machinery & Electrical	-0.052	0.011	-0.037
	(0.039)	(0.030)	(0.053)
RTA depth × Transportation	0.161*	0.081	-0.170
	(0.090)	(0.096)	(0.120)
RTA depth × Miscellaneous	-0.157***	-0.014	0.062
	(0.043)	(0.033)	(0.053)
Distance (ln)		-0.230***	
		(0.026)	
GDP (ln)		0.066***	
		(0.012)	
Fixed Effects			
Sector		Yes	
FirmYear		Yes	
Observations		213,252	

Notes: Ordinary least square estimates, destination-year cluster standard errors in parentheses. ***, ** and * indicate statistical significance levels for p-val. < 0.01, p-val. < 0.05, and p-val.< 0.1.

4.4 Quality heterogeneity

The improved market access granted by deep RTAs may also have a heterogeneous effect by the quality ladder of the exported product. To test this further source of heterogeneity in the effect of deep RTAs, we combine our data set with the World Trade Flows Characterization data set (CEPII),[13] and interact the deep RTA variable with three quality ladders of the exports of Georgian firms: low, medium and high quality.[14] Result, reported in Table 18, show that the depth of RTA stimulates the export of firms in all the three quality-ladders, but with a bigger extent the exports of Georgian firms in the low-quality ladder of products. In particular, a 10% increase in the depth of RTAs implies a 1.1% and 0.8% increase in the export of firms in respectively the low- and high-quality ladders.

Table 18: Deep RTAs and product quality.

	Exp (ln)	Exp (ln)
	(1)	(2)
RTA depth × High quality	0.079***	0.081***
	(0.024)	(0.027)
RTA depth × Medium quality	0.059**	0.047
	(0.027)	(0.031)
RTA depth × Low quality	0.110***	0.117***
	(0.024)	(0.029)
Distance (ln)	-0.127***	-0.209***
	(0.032)	(0.041)
GDP (ln)	0.073***	0.104***
	(0.015)	(0.019)
Ln(tariff+1)		-0.563**
		(0.240)
Fixed Effects		
Sector	Yes	Yes
Firm-Year	Yes	Yes
Observations	99,166	84,837

Notes: Ordinary least square estimates, destination-year cluster standard errors in parentheses. ***, ** and * indicate statistical significance levels for p-val. < 0.01, p-val. < 0.05, and p-val.< 0.1.

[13] `http://www.cepii.fr/CEPII/fr/bdd_modele/presentation.asp?id=29`

[14] For each destination-product combination, the World Trade Flows Characterization data set provides information of the quality ladder.

Table 19: The extensive margin effect of deep RTAs.

	$\mathbb{P}[exp > 0]$	$\mathbb{P}[exp > 0]$	$\mathbb{P}[exp > 0]$	$\mathbb{P}[exp > 0]$	$\mathbb{P}[exp > 0]$	$\mathbb{P}[exp > 0]$
	(1)	(2)	(3)	(4)	(5)	(6)
RTA	0.007***					
	(0.001)					
RTA depth (legal)		0.002***	0.002***	0.002***	0.000	
		(0.000)	(0.000)	(0.000)	(0.000)	
RTA depth × GVC					0.002***	
					(0.000)	
RTA depth × Big						0.003***
						(0.000)
RTA depth × Medium						0.001***
						(0.000)
RTA depth × Small						0.000
						(0.000)
Distance (ln)	-0.003***	-0.004***	-0.004***	-0.004***	-0.004***	-0.004***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
GDP (ln)	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Fixed Effects						
Firm	Yes	Yes	No	No	No	No
Year	Yes	Yes	No	No	No	No
Firm-Year	No	No	Yes	Yes	Yes	Yes
Observations	14794421	14794421	14794421	14794421	14792158	14792158

Notes: Ordinary least square estimates, destination-year cluster standard errors in parentheses. ***, ** and * indicate statistical significance levels for p-val. < 0.01, p-val. < 0.05, and p-val.< 0.1.

4.5 The extensive margin effect of RTAs

In this section we show the effect of deep RTA on the participation (extensive) margin of trade for Georgian firms. Results in Table 19 show that deep RTA increase the probability that the average Georgian firm serves a given destination d at time t, see columns (2) - (4). This effect is entirely driven by GVC and large firms (see respectively column (5) and (6) of Table 19). In the same vein, in Table 20 we show the effect of deep RTAs on the probability of first entry into a given destination d at time t. The reduction in the non-iceberg trade export costs implied by deep RTAs are expected to help firms to start exporting into a new market (i.e. probability of serving a destination that was not reached before). In Table 20 we show baseline results on this margin of trade and find that deep RTAs have a significant positive effect on the probability to start exporting. This effect is magnified for GVC firms.

Table 20: Deep RTAs and the probability of start exporting.

	$\mathbb{P}[exp_t > 0\|_{exp_{t^-}=0}]$					
	(1)	(2)	(3)	(4)	(5)	(6)
RTA	0.002***					
	(0.000)					
RTA depth (legal)		0.000***	0.000***	0.000***	0.000**	
		(0.000)	(0.000)	(0.000)	(0.000)	
RTA depth × GVC					0.000***	
					(0.000)	
RTA depth × Big						0.000***
						(0.000)
RTA depth × Medium						0.000***
						(0.000)
RTA depth × Small						0.000
						(0.000)
Distance (ln)	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
GDP (ln)	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Fixed Effects						
Firm	Yes	Yes	No	No	No	No
Year	Yes	Yes	No	No	No	No
Firm-Year	No	No	Yes	Yes	Yes	Yes
Observations	14794421	14794421	14794421	14794421	14792158	14792158

Notes: Ordinary least square estimates, destination-year cluster standard errors in parentheses. ***, ** and * indicate statistical significance levels for p-val. < 0.01, p-val. < 0.05, and p-val.< 0.1.

5 Conclusions

In this paper we investigate the impact of Georgia's regional trade agreements on the performance of its exporting firms. The assessment provides some reassuring news, but also reasons for concern. The deeper agreements that Georgia has signed in recent years have contributed to boost its exports, facilitated entry into new markets for Georgian firms and promoted their participation in global value chains. These effects, however, have been asymmetric. First, while large firms have benefited from new RTAs, smaller firms have been negatively affected. To the extent that smaller firms are the least productive, this result may suggest some reallocation of resources within the Georgian economy that can boost productivity. But one cannot exclude that also productive small exporters have not managed to take advantage of the opportunities created by the RTAs. Second, while firms in the agriculture sector have benefited from the trade agreements, the analysis finds a statistically significant impact on firms' exports only for a few manufacturing sectors. Third, Georgia's deep RTAs have promoted exports of both high and low-quality products, but relatively more of the latter type. These results point to the need to complement the new RTAs with policy actions aimed at promoting the productivity, sophistication and survival of small productive firms.

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Appendix tables and figures

Figure A1: Number of exporting firms: sector 87 vs all remaining sectors.