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JEL codes: F13, F14, F15, F63

Key words: GSP, graduations, trade policy, preferences

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A key feature of the EU's Generalized System of Preferences (GSP) scheme is its graduation mechanism, whereby preferential market access for imports to the EU is withdrawn from beneficiaries in sectors in which they are considered to be sufficiently competitive. This paper estimates the effect of competitiveness-related preference removals by exploiting 'surprise graduations' that arose from the 2014 GSP reform and could not realistically have been foreseen. We find a strongly negative impact on affected countries and products' export performance to the EU, with trade values dropping by nearly 35% on average after three years. The effect differs appreciably across affected GSP beneficiaries, with the fall in EU imports ranging from -24% from India to -67% from Nigeria. Graduations are found to bite where it would hurt beneficiary countries the most, namely in products for which the GSP had enabled export success. At the same time, we also find evidence of a positive spillover effect to closely related non-GSP eligible products, exports of which increase as firms redeploy resources away from affected to non-affected products.

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1. Introduction

Since the 1970s developing countries have received non-reciprocal preferential market access in several developed economies. These preferences are an exception to the principle of 'non-discrimination' in the GATT/WTO system, which was introduced to stimulate export-led economic growth in developing economies. Several preferences schemes have been created for this purpose (Ornelas and Ritel, 2020), most notably the Generalized Systems of Preferences (GSP), of which the EU GSP was the first to be established in 1971. The main feature of GSP schemes is that their members unilaterally benefit from lower than Most-Favoured-Nation (MFN) tariffs when exporting to the donor country. This preferential treatment is intended to confer to firms in member countries an advantage over their competitors in non-member countries and, for the EU GSP, it has been shown to have impacted positively on trade between donors and beneficiaries (Thelle et al., 2015)[1].

One particular aspect of the EU GSP scheme is that beneficiaries can 'graduate' from the scheme if they become particularly competitive in specific product sections. This results in the removal of the preferential treatment and the reversal to MFN tariffs on imports from the competitive country-section pairs.[2] Competitiveness is measured as the share of EU imports from a beneficiary in a section, out of total EU imports from all GSP members in that section: graduations occur if that import-share exceeds a certain threshold. Hence, the competitiveness of a GSP member *relative* to other members in its trade with the EU can determine the loss of its preferential market access.

An important question, therefore, is whether the export performance of the graduated sections suffers from the removal of trade preferences, or whether graduations target producers which have achieved a genuinely strong level of competitiveness and therefore do not need to rely on preferential treatment anymore. The salience of this research question is compounded by the fact that competitiveness-related graduations are imposed on countries that remain GSP beneficiaries, as their income-per-capita is below the (upper-middle income) level which would trigger the exclusion of the country from the scheme: a negative trade effect of graduations would go against the main objective of preferential schemes, which is to stimulate growth in developing countries (Hakobyan, 2017).

[1] Both positive and negative trade effects of GSP schemes have been found in the literature (e.g. Gil-Pareja et al., 2014; Herz and Wagner, 2011). Ornelas and Ritel (2020) confirm that the overall effect of non-reciprocal trade preferences is unstable when the impact of all the existing schemes is evaluated jointly, and show that WTO membership interacts with the effect of preference schemes.

[2] A second type of graduation occurs if beneficiaries are classified as upper-middle income countries by the World Bank for three consecutive years. In that case a country is removed from the scheme, and its imports face again the EU MFN tariffs. These "country graduations" are not the focus of this paper; Gnutzmann-Mkrtchyan and Volmer (2022) provide an analysis of their impact.

This paper is the first to rigorously assess the trade impact of the country-section graduations from the EU GSP that arose from the 2014 GSP reform. The reform amended several features of the EU GSP and thereby triggered a number of arguably unexpected graduations that would not have occurred under pre-2014 rules. Our research design exploits this feature of arguably exogenous graduation shocks, which enables us to identify the trade impacts of preference removals. In particular, as graduations only hit *some* GSP members and a subgroup of products exported by them, we can exploit alternative control groups for identification.

We find that competitiveness-related graduations had a negative impact on EU imports from the affected countries: in our preferred empirical specification based upon a triple-difference estimator we detect a fall in EU imports by 29% on average. The effect is found to increase over time, from -17% in the first year post-graduation to -35% in the third year. Moreover, we detect substantial heterogeneity across affected beneficiaries, with the drop in EU imports ranging from -24% in India to -67% in Nigeria.

After having established the sign and magnitude of the main effect of graduations, we exploit some of the features of the EU GSP scheme to investigate additional hypotheses that shed further light on the forces that shape the substantial fall in EU imports.

First, we estimate the effect of graduations separately by groups of products that, pre-graduation, benefited from larger (i.e. above median) or smaller (i.e. below median) preferential tariff margins. We find that the fall in EU imports is completely driven by products that used to benefit from a larger margin: for these products market access conditions worsen more, hence it would stand to reason that they undergo a larger trade contraction. A less benign interpretation of this finding suggests, however, that the trade performance of high-margin products is greatly sustained by the tariff preferences: once the more advantageous trading conditions are revoked, their trade performance suffers.

Next, we try to assess if the graduation mechanism in the EU GSP does indeed target the most competitive products, or creates also some 'collateral damage'. In the EU GSP product eligibility for preferential tariffs is established at the detailed Combined Nomenclature (CN) 8-digit level, but preference removal occurs at the section level[3]: this mismatch in product levels implies that, while a given GSP-section's overall competitiveness is likely to be driven by a subset of products, the graduation will alter trading conditions for *all* the products that fall within that section. The

[3] In the EU GSP, the competitiveness related graduations occur at the level of 32 sections, which have been derived from the 21 sections of the HS classification. Note, however, that while HS-sections are an exhaustive partition of all the products in the classification, GSP sections include only a fraction of products (about 66% of the tariff lines at the 8-digit level).

loss of preferences can therefore affect exports of both more and less competitive products: if trade of the latter is disrupted, this can largely be considered collateral damage. To investigate this hypothesis, we construct a product-level measure of competitiveness akin to that determining graduations at the section level, i.e. the share of EU imports in an 8-digit product from a GSP member, out of total EU imports in that product from all GSP members. We find that the negative impact of the removal of preferences is driven by the high-competitiveness products[4], with no evidence that graduations result in collateral damage. The flip side of this result is that graduations can be harmful to developing countries, as trade losses are concentrated in precisely those products that exhibit the highest import shares in the EU market. Specifically, we find that successful products are negatively affected by graduations only if they benefited from a high preferential margin pre-graduation, whereas high import share products with small preference margins are unaffected. As this finding suggests that those products' trade performance was artificially inflated by a large tariff margin, we conclude that graduations remove preferential market access before products have genuinely achieved cost competitiveness.

Lastly, we explore the possibility that the impact of graduations could spill over to trade in products that are not formally affected because they are not eligible for GSP *ab initio* but that are nonetheless closely related to the graduated ones in terms of product classification. To see the potential concern, consider that a HS 6-digit (or 4-digit) product group can include both GSP-eligible and non-GSP-eligible products, because eligibility is defined at the 8-digit level.[5] This implies that when a graduation of an eligible product occurs (e.g., preparations based on goose liver) its impact might spill over to non-eligible products (hence non-affected; e.g. preparations based on turkey meat) that can be considered closely-related because they belong to the same 4-digit HS group.[6] We find some evidence suggesting that graduations result in an increase in EU imports of closely-related non-graduated products, relative to imports of other non-graduated products, indicating that firms redirect resources towards the production and trade of products whose trading conditions are unchanged.

[4] It is not *a priori* clear whether the effect of graduations on the level of EU imports should be larger or smaller on higher or lower competitiveness products, as competitiveness is defined by the share of imports out of the total of a certain product, not out of total of all imports.

[5] For instance, section 4-a (Preparations of meat and fish) is very detailed about which products are eligible for GSP treatment. In the 4-digit product group 1602 (Other prepared or preserved meat, meat offal, blood or insects), product 1602 20 10 (Goose or duck liver, prepared or preserved) is eligible for GSP, but products based on turkey meat 1602 31 11 or 1602 31 19 are not.

[6] This scenario is possible in case there are multiproduct firms engaged in the production of both GSP-eligible and non-GSP-eligible products We do not have access to firm level data which would allow us to test this hypothesis directly, but results obtained with our more aggregate product level data can be considered a lower-bound estimate of this effect.

This paper contributes to the literature investigating the trade effects of preferences schemes (Borchert, 2009; Frazer and Van Biesebroeck, 2010; Herz & Wagner, 2011; Gil-Pareja et al., 2014; Borchert and Di Ubaldo, 2020; Ornelas and Ritel, 2020; Teti, 2020; Forge et al., 2021), and in particular to those studies that analyse the impact of preferences removals (Devault, 1996; Hakobyan, 2017, 2020; Albornoz et al., 2021; Gnutzmann and Gnutzmann-Mkrtchyan, 2022). On the one hand, this literature has found mixed effects on the trade-creating effects of preferential schemes, especially when attempting to evaluate the impact of the various schemes jointly with a single (average) estimated coefficient. The main reason is that substantial heterogeneity exists across the structure and the effects of preferential schemes. On the other hand, studies that investigate the *removal* of preferential tariffs, as opposed to the granting of preferences, seem to concur that the loss of preferences has negative impacts on trade of the affected countries. Hakobyan's (2017) study is closest to our paper insofar as she investigates the impact of exclusions from the US GSP scheme (via Competitive Needs Limits). She too finds US imports of the affected products to fall, whereas the shares of other GSP members' and of non-GSP members in US imports both increase.

This paper explores a related research question under the different setting of graduations occurring in the EU GSP scheme. We confirm that graduations are harmful for exports of affected products and show that the extent of the preferential treatment loss matters for the size and significance of the effect on trade. Importantly, the trade losses are driven by those products in which the graduated country-section pairs can be considered to be most competitive. We also find that the impact can spill-over (positively) to closely related non-graduated products.

The remainder of this paper is organized as follows. Section 2 provides an overview of the related literature, while Section 3 outlines the relevant features of the EU GSP scheme and the changes introduced by the 2014 reform. Section 4 sets out the methodology and Section 5 discusses the estimation results. Section 6 concludes.

2. Related Literature

Special provisions in the WTO Agreements allow for the possibility of treating developing countries on more favourable terms than other WTO members. This 'special and differential treatment' (SDT) may include, but is not limited to, allowing longer time periods for implementing agreements, supporting capacity building and technical assistance to comply with standards, and granting non-reciprocal preferential treatment to products originating in developing countries. The latter is the underpinning concept of the so-called Generalized System of Preferences (GSP)

schemes, whereby high-income (or developed) countries grant lower- or zero-duty access to products originating in developing countries. The country and product coverage of the scheme itself varies by donor country, as do the criteria used to grant and revoke preferences. Nevertheless, the main objective of GSP schemes is to promote export-led growth in developing countries that can in turn alleviate poverty and create jobs.

Assessing the effectiveness of the SDT system has mainly revolved around quantifying the effect that non-reciprocal trade preferences (NRTPs) have on beneficiary countries' exports to donor countries. Ozden and Hoekman (2005) and Ornelas (2016) provide extensive and critical surveys of the literature surrounding SDT, with the latter devoting particular attention to the effects of NRTPs and the GSP scheme on developing countries.

Insights on the trade effects of NRTPs has partly been incidental in studies that evaluate the trade effects of being a member of the WTO and include the GSP-beneficiary status as a control in the econometric specifications. Rose (2004), Subramanian and Wei (2007), and Tomz et al. (2014) find large positive effects of being a GSP beneficiary, while Liu (2009) finds a negative effect, although results vary according to the specification. Studies that explicitly examine the effect of GSP (or other NRTPs) schemes on trade also find mixed results. Sapir (1981) provides one of the earlier estimates, and finds a positive effect on the manufacturing exports from developing countries to the European Economic Community (EEC). Also Gil-Pareja et al. (2014) find evidence of a positive effect of NRTPs on developing countries' exports: the effect, however, is heterogeneous across schemes, with the GSPs of Australia, Japan and New Zealand being found to have no effect.

Herz and Wagner (2011) present evidence that GSP schemes can boost exports in the short-run but find a negative and statistically significant effect on exports in the long-run. In one of the most extensive studies by means of time and preferential schemes coverage, Ornelas and Ritel (2020) use data for 1950-2015 and find that NRTPs promote exports of non-LDC beneficiaries only if they are not WTO members (i.e. preferences help only if tariffs are not already very low), and for LDCs only if they are WTO members (the poorest countries can take fully advantage of GSP preferences once complementary reforms – institutional and infrastructural – are undertaken, these being often prompted by WTO membership).

Overall, the literature on the aggregate trade effect of GSP schemes is not conclusive, but leans towards positive albeit unstable effects (Ornelas, 2016). Even so, the magnitude and statistical significance of the estimates vary widely across and within studies. These inconsistencies have been attributed to unsuitable methodological approaches and econometric specifications, sample selection, as well as difficulty in gathering consistent (and correct) information on the schemes'

product eligibility and membership (Ornelas and Ritel, 2020). Furthermore, the aggregated nature of the aforementioned studies masks the characteristics of the GSP schemes, which are defined at the country-product level. For this reason, other studies have focused on specific preferential schemes and have exploited sectoral- or product-level data. Among these, Frazer and Van Biesebroeck (2010) find that NRTPs offered under the African Growth and Opportunity Act (AGOA) increase members' exports to the US by 13%, on average. Thelle et al. (2015) consider the effect of all European NRTPs and find that EU GSP preferences promote exports of recipient countries and covered products by nearly 5% on average. They also find that the effects are twice as large for LDCs. Forge et al. (2021) add that a wave of trade reforms in OECD economies introducing tariff cuts in favour of LDCs has resulted in an expansion of trade, but along the existing patterns of trade rather than widening LDCs' export diversification.

Besides the studies on the effect of granting NRTPs, there is a smaller but growing literature on the effect that the removal of NRTPs has on trade. Preference removal in the EU GSP have been studied by Zhou and Cuyvers (2011), Gnutzmann and Gnutzmann-Mkrtchyan (2022), and Gnutzmann-Mkrtchyan and Volmer (2022). The first two studies focus on GSP preference withdrawals due to sanctions imposed by the EU in response to labour rights violations. Zhou and Cuyvers (2011) analyse the cases of Myanmar in 1997 and Belarus in 2006, and find limited effectiveness of GSP withdrawal on trade, but argue that the sanctions can signify political commitments to upholding labour standards and other international values. Gnutzmann and Gnutzmann-Mkrtchyan (2020) also study the Belarus case and find negative and significant effects on trade flows for GSP-eligible products in the realm of 26% to 29%. They do not find evidence that the removal of NRTPs had an effect on Belarus' total trade, due to the fact that the main exports of Belarus were not eligible for preferences in the EU GSP scheme. Gnutzmann-Mkrtchyan and Volmer (2022) study the impact of exclusions of countries from the EU GSP in the context of the 2014 reform, due to them being classified as 'upper-middle income' by the World Bank, and find a negative trade impact of approximately 7.3%.

Albornoz et al. (2021) is the first study examining the effect of GSP preferences removal by using firm-level custom data. This is done in the context of the sudden removal of US GSP tariffs applied to Argentinian products in 1997. The permanent suspension of the US GSP benefits for Argentina was the consequence of a dispute over the infringement of foreign intellectual property rights. Tariffs on the affected products increased by almost 4 percentage points, to which the authors attribute a negative and significant impact on trade flows at both the intensive and extensive margins.

Hakobyan (2017, 2020) studies the effect of preference removals in the context of the US GSP. Hakobyan (2020) considers the effect of the US GSP expiration on beneficiaries' trade flows, in a setting that is slightly different as it relates to the (temporary) expiration of the entire US GSP program and thus affects all eligible products across-the-board, not just selected ones; however, the econometric design using a triple difference estimator is comparable. In this setting, she finds that, on average, exports to the US dropped by 3%, with persistent effects. Hakobyan (2017) is the paper closest to ours because it examines the effect of selective exclusions due to US GSP's Competitive Needs Limit (CNL), a feature of the US GSP that revokes preferential tariffs for 'super competitive products.' This definition is met when the amount of US imports of a particular product, or its share in total US imports, exceed specific thresholds.[7] This study finds that CNLs induce a large and significant drop in US imports following the revocation of tariff exemptions if assessed over time, although positive (but decreasing) effects are estimated in difference-in-difference models and a triple difference specification that would be comparable to this paper. Focusing on the negative trade effects of CNLs in the time dimension, Hakobyan (2017) concludes that existing criteria in US CNLs are unable to identify those exporters that would no longer require such preferential treatment.

Despite the similarity of Hakobyan's research question to ours, the mechanisms by which US and EU GSP beneficiaries are stripped of preferential tariffs differ substantially, as does the extent to which status changes could have been expected, i.e. the exogeneity of the shock. First, the difference in the mechanism, at the product-level in the US and the section-level in the EU, is likely to be a reason why different estimates of the magnitude of the effects are found, in particular relative to various control groups. The EU mechanism also allows us to investigate new and different hypotheses, e.g., on the potential collateral damage resulting from EU GSP graduations. Second, the exogeneity of the shock is much more plausible in the context of EU GSP graduations triggered by the 2014 reform. The level at which US CNLs and EU graduations occur (8-digit versus section) and, crucially, the surprise effect of the EU reform, are the two main reasons why CNLs are much easier to predict for an exporter in a GSP member country.[8] Being able to exploit an unexpected event is crucial to obtain unbiased and possibly causal estimates of the impact of preferences removals. It also allows us to avoid anticipation effects which can influence the

[7] In the US GSP there are two types of CNL thresholds, in terms of an absolute import value (set to $80 million in 1997, and rising by $5 million every year) and an import share (50% of total US imports of a product). Also MacPhee and Rosenbaum (1989) and DeVault (1996) investigate the impact of exclusions from the US GSP due to the application of CNL. Both studies are descriptive in nature and suggest that beneficiaries' exports decline in the year preferences are suspended, and continue to fall in subsequent years.

[8] Especially CNLs based the value US imports (rather than the share) are definitely rather predictable.

estimated effects of the graduations. Lastly, Hakobyan's (2017, 2020) results are not conditional on time-varying product-level tariffs applied to specific beneficiary countries.

3. The EU GSP Scheme and Its 2014 Reform

Through its GSP, the EU offers preferential market access to all low and lower-middle countries[9] that do not have an alternative preferential trade arrangement with the EU. The scheme was first introduced in 1971 and has changed considerably since then through three main reforms (in 1995, 2005 and 2014), which have focused the preferential treatment towards those economies most in need and made the scheme more predictable for its beneficiaries. Currently, the EU GSP features three sub-schemes, the Standard GSP, the GSP+, and the Everything-But-Arms (EBA) initiative, in ascending order of preferential access to the EU market. Standard GSP members benefit from lower than EU CET (or MFN) tariffs on about 66% of the tariff lines at the 8-digit Combined Nomenclature (CN) level, whereas GSP+ and EBA offer deeper preferential treatment under certain conditions.

Unlike in the GSP+ and the EBA sub-schemes, members of the Standard GSP scheme face the risk of having their trade preferences withdrawn from specific product sections in case they become internationally competitive. This mechanism, which we refer to as *competitiveness-related graduation*, is based on the calculation of import-shares: preferences are withdrawn from a country-section pair in case the share of EU imports from that country-section, out of the total EU imports from all GSP members in that section, exceeds a certain threshold. The graduation is therefore not based on the *absolute* competitiveness of a country in a certain section, but on its *relative* competitiveness out of all the other GSP members. The import-shares are computed every three years, with data for the preceding three years (over which the yearly shares are averaged), and the graduations last for the subsequent three years. For instance, graduations for the 2014-2016 period were based on the import-shares computed with EU import data for the 2009-2011 period.

The relatively complicated way in which import-shares are computed makes it difficult for a particular GSP member to predict the occurrence of a graduation, especially because the trade performance is evaluated relative to that of all the other GSP members.[10] In addition to this, our research design exploits the 2014 reform of the EU GSP scheme, whereby the EU amended

[9] As defined by the World Bank income per capita classification.
[10] This would make it virtually impossible for a country to 'manipulate' its import-shares to avoid a graduation, even if it could coordinate the activity of its exporters.

various elements of the scheme that triggered a number of arguably unexpected country-section graduations. In particular:

a. The membership was substantially reduced. All upper-middle income countries, countries members of alternative trade agreements with the EU, and territories under the control of EU countries, were removed from the GSP scheme. This brought the number of beneficiaries from 177 to 88, drastically reducing the denominator used in the construction of the graduation import-shares.
b. The number of sections that are used to calculate the import-shares was expanded from 21 to 32, i.e. some sections were split into two or three sub-sections.
c. The import-share thresholds were increased, from 15% (12.5% for textiles) to 17.5% (14.5% for textiles), to partly offset the mechanical change in competitiveness resulting from the reduction in GSP membership.

These interventions implied that, in 2014, some country-section pairs previously benefiting from GSP preferences suddenly exhibited an import-share that exceeded the graduation threshold. These graduations can be argued to have been largely unexpected, as mostly arising from the unpacking of the product sections from 21 to 32, and the large change in country membership, rather than changes in trade patterns. For these reasons, the reform provides a shock in the GSP treatment that can be used to identify the impact of GSP preferences on trade between the EU and its beneficiaries.

Table 1: 2014 country-section graduations used in analysis

Country	Section	Value (€m)	% aff.	Expected imp. share	Actual imp. share
India	S-5 – Mineral products	12	0.2%	8.2%	54.2%
	S-6a – Inorganic and organic chemicals	2,188	43%	11.4%	22.1%
	S-6b – Chemicals, other than organic and inorganic chemicals	833	16%	11.4%	17.7%
	S-8a – Raw hides, skins, and leather	222	4%	12.7%	28.9%
	S-17b – Motor Vehicles, bicycles, aircraft and spacecraft, ships and boats	1,830	36%	14.1%	26.9%
Indonesia	S-1a – Live animals and animal products excluding fish	15	2%	2.2%	47.1%
	S-6b – Chemicals, other than organic and inorganic chemicals	731	98%	4.7%	19.0%
Nigeria	S-8a – Raw hides, skins, and leather	107	100%	1.1%	18.3%
Ukraine	S-17a – Railway and tramway vehicles and products	105	100%	0.8%	35.3%

Note: Values are in million Euros; values and shares figures are for 2013. Expected and actual import shares are computed with 2009-2011 data. Source: Authors' elaboration.

The 2014 reform triggered nine *new* graduations among the countries in our sample of analysis, i.e. nine country-section pairs had their preferences removed for the first time in 2014.[11] These products account for a share of EU imports in the range of 5.5%-8% over the 2009-2016 period, which we use in this paper, and will constitute our treatment group in estimation. Table 1 provides an overview of these graduations. In the first two columns we report the value of trade affected by graduations (in million Euro), as well as the share of each section in the total of affected trade for each country. The last two columns show the stark difference in the import-shares that would have resulted in the absence of the changes introduced by the reform (i.e. the share that could have been expected by GSP members), and those resulting under the post-reform setting (i.e. the 'actual import share'). We computed both import-shares with data over the 2009-2011 period.[12] The expected import-shares are all below the threshold of 15% that applied in the pre-reform setting, while the actual import shares are substantially higher than the expected ones, and above the (new) graduation threshold of 17.5%, which resulted in the loss of GSP preferences. Importantly, during the 2009-2011 period, the changes in the structure of the GSP introduced by the reform were not known by the affected countries, as the reform was announced in the EU Regulation 978/2012 published in October 2012. In sum, we believe that the loss of preferential access to the EU in 2014 of certain country-sections could realistically not have been foreseen.

Figure 1 shows a decomposition of total EU imports by the shares of trade originating[13] in non-GSP and GSP members, where the latter has been further decomposed in imports of GSP and non-GSP eligible[14] products. Other than the overall importance of the GSP scheme in EU imports, this figure also allows us to inspect the relevance of the changes introduced by the 2014 reform. Up to 2013, non-GSP members (including high-income countries members of EU FTAs and countries with which the EU trades on MFN terms) accounted for approximately 40% of EU imports. GSP eligible products accounted for about one third of the 60% originating in GSP members (or 20% of total EU imports), and non-GSP eligible products accounted for the remining two thirds (or 40% of total EU imports). The exclusion of about half of the GSP members from

[11] India was also graduated in textiles (S -11a), but this was not a graduation occurring for the first time in 2014. Indonesia had already been graduated in Animal or vegetable oils, fats, and waxes (S-3). This list also excludes the 2014 country-section graduations affecting countries that exited the GSP scheme in 2015 and 2016 (i.e. China, Costa Rica, Ecuador, Thailand). These latter countries are not included in our sample of analysis, as post-graduation trading conditions were also affected by their complete removal from the GSP scheme, therefore providing a less suitable treatment group to investigate the effect of graduations. Our estimation results are robust to the inclusion of these countries in the analysis, however. More details on our sample of analysis are provided in section 4.2 below.

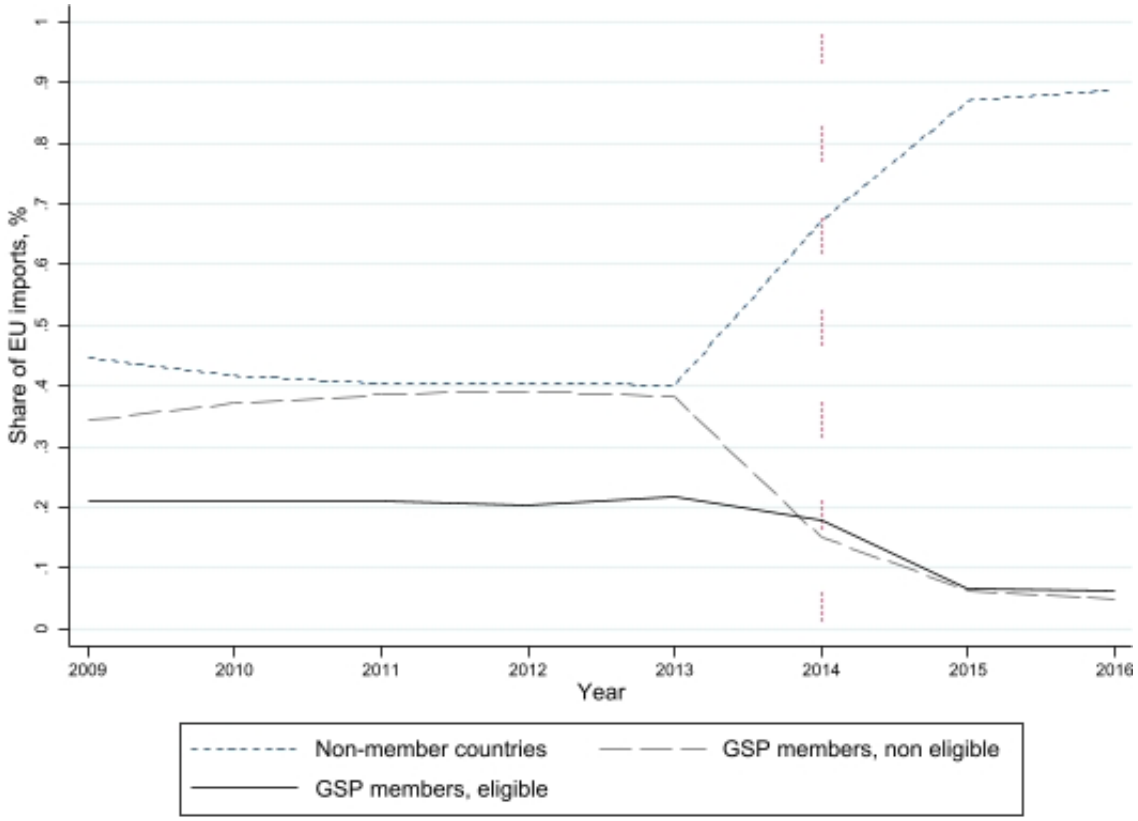
[12] These are the years used by the EU to compute import-shares relevant to the 2014 graduations.

[13] We use the term "originating" to denote the countries where products were shipped, and not the originating status that would have to be proved in order to receive the preferential treatment. We do not have information on the latter.

[14] Product eligibility in this paper is defined according to the list of tariff lines that can potentially obtain preferential treatment as indicated in the EU GSP Regulation (EU regulation 978/2012). To claim the preferential tariffs the section must not have been graduated, and exporters have to prove that a GSP eligible product complies with the Rules of Origin in the EU GSP scheme.

the scheme in 2014 shows as a jump of the share of non-member countries to about 70% of the total, with the subsequent exits in 2015 (most notably that of China) bringing this share to almost 90%. The shares of GSP members correspondingly contracted over the 2013-2015 period, but most of the fall was in trade of non-GSP eligible products: this suggests that the countries leaving the GSP scheme in these years (especially in 2014) were mostly trading in products that could not be subject to a preferential treatment. Post-2014 reform, the share of GSP products can be seen to remain at slightly over 10% of the total, and roughly equally divided in GSP eligible and non-GSP eligible products.

Figure 1: decomposition of EU imports by GSP membership and product eligibility



Source: authors' elaboration

This substantial rearrangement in GSP membership, that occurred at the same time as the graduations whose effect we investigate in this paper, will be considered in our empirical methodology. In particular, we will restrict the estimation sample to countries whose trading conditions with the EU remained similar pre- and post-2014 reform, except for the change brought about by the competitiveness-related graduations.

4. Empirical Methodology

4.1. Data

In order to assess the trade impact of the 2014 country-section graduations, we combine data from three different sources.

Information on EU imports is obtained from EU COMEXT. From this database we extract data on EU imports from all partner countries worldwide, at the 8-digit Combined Nomenclature level and annual frequency, for the 2009-2016 period. To ensure consistency in the CN product classification over time, we adopt the product-code concordance routine of Van Beveren et al. (2012) and concord the CN codes back to the 2009 version of the classification. We rectangularize these data to create a full matrix of country-product-year observations, which allows us to include zero trade flows in the analysis.

Information on the list of products eligible for preferential treatment in the EU GSP is obtained from the UNCTAD TRAINS database. We export this information separately the three GSP sub-schemes, at a yearly frequency. From TRAINS we also obtain data on the tariff rates applied to GSP eligible products, as well as the EU MFN rates: the difference between the two rates corresponds to the preferential tariff margin, which we also exploit in the empirical analysis.

Lastly, this analysis requires information on EU GSP beneficiaries, as well as graduation episodes, which we obtain from the EU GSP Regulations as published in the *Official Journal of the European Union*. This implied examining the Annexes of a number of Regulations to ensure, for instance, that changes in the membership are correctly tracked over time[15], to differentiate among the various reasons for a country's exclusion from the EU GSP[16], and to create a mapping between the GSP sections used pre- and post-2014 reform.

4.2. Main Sample of Analysis

The significant re-structuring of the EU GSP scheme operated by the 2014 reform, together with some income-related GSP exclusions and new FTAs signed by the EU over the period under analysis, resulted in heterogenous changes in market access to the EU for different groups of GSP members. All upper-middle countries, countries with existing alternative trade agreements with the EU, and territories controlled by EU members, were excluded from the scheme in 2014. The

[15] As explained in Ornelas and Ritel (2020), one the main reasons why some of the previous studies failed to detect a statistically significant trade creating effect of GSP schemes is the incorrect coding of countries' and products' eligibility (and their changes over time), for the various preferential schemes.

[16] This matters for the calculation of the graduations import-shares, as countries leaving the GSP due to the signature of an FTA are not included in those calculations.

EU-Central America and the EU-Colombia-Peru FTAs have both provisionally been applied since 2013.[17] Other countries left the EU GSP when they reached the conditions for a country-graduation (i.e. they had been classified as upper-middle income countries by the World Bank for three consecutive years): China, Thailand, Ecuador and the Maldives in 2015, Botswana, Namibia and Turkmenistan in 2016. Whereas examining the effect of the aforementioned changes in market access to the EU is beyond the scope of this paper (for an analysis of the trade impacts of country-graduations see Gnutzmann-Mkrtchyan and Volmer, 2022), it would also be erroneous to keep the countries undergoing these changes in the estimation sample, as they would constitute an imperfect control group for the countries that remained in the GSP scheme but were affected by competitiveness-related graduations in some of the sections. For these reasons, we construct the estimation sample by retaining only the countries that remained beneficiaries of the EU GSP (under either of the three sub-schemes[18]) for the entire period of analysis, i.e. 2009-2016. We also remove from the estimation sample products that are not eligible for the preferential treatment, as per EU GSP regulation, because these products could never be subject to a graduation. After making these interventions, we are left with data on EU imports from 81 countries, over 8 years, in 6667 different products at the CN-8-digit level.

Table 2 shows some key descriptive statistics computed on the estimation sample. The graduations affected four countries, India being by far the largest of them, and 859 different products. The control observations can then be split in non-affected products exported by affected countries, affected products exported by non-affected countries, and unaffected products exported by non-affected countries. The latter is the largest group in terms of observations, but the first control group is the most similar in terms of mean trade values to the observations affected by graduations.

We report also statistics on the tariffs and tariff-margins applied in the EU on imports of products affected by graduations: for these, the mean applied tariff increased from less than 1% to 5.5% post-graduation; put differently, the average preferential margin lost was about 4.5 percentage points.

Next, we look at the distribution of the product-level competitiveness measure we calculated. We split the observations in quintiles and then compare the bottom four with the top quintile:

[17] The countries members of these FTAs left the EU GSP after a 2-year transition period, although they could effectively start using FTA preferences from when the agreements were provisionally applied.

[18] All our results are robust to excluding from the estimation sample countries members of the GSP+ and the EBA scheme. On one side, GSP+ members' trading conditions with the EU improved post 2014 reform, as their preferences were made more certain, this resulting in an increase in EU imports from GSP+ countries post-reform (Borchert and Di Ubaldo, 2020). For this reason, GSP+ countries might constitute an imperfect counterfactual for graduated sections of Standard GSP members. On the other side, EBA countries' preferences are broader than those of Standard GSP members, as they extend to more products. As mentioned, however, excluding from the sample either GSP+ countries, EBA countries, or both, leaves our results unchanged.

interestingly, the observations affected by graduations are roughly equally split between these two subgroups, although with starkly different mean competitiveness levels (1.3% on average on the bottom four quintiles, and 35.2% for the top quintile).

Table 2: descriptive statistics of estimation sample

Sample for analysis on affected products						
			EU imports, in million Euro			
		N Obs.	Mean	St. Dev.	Min	Max
Affected by graduations	India	6,038	6.53	37.52	0	1,297
	Indonesia	1,408	4.17	40.69	0	991
	Nigeria	120	4.83	14.06	0	64
	Ukraine	152	4.14	10.61	0	88
	Tot. affected prod. in affected countries	7,718	6.03	37.54	0	1,297
Control Observations	Unaffected prod. in affected countries	116,812	2.07	19.48	0	2,532
	Affected prod. in unaffected countries	58,292	0.34	4.66	0	312
	Unaffected prod. in unaffected countries	605,450	0.66	27.87	0	8,692
Full sample[19]		778,352	0.90	26.01	0	8,692
			Applied tariff			
Affected by graduations	Pre-graduation	4,736	0.9%	1.9%	0%	30%
	Post-graduation	2,982	5.5%	3.7%	0.7%	106%
	Total	7,718	2.6%	3.6%	0%	106%
Full sample		778,352	1.39%	3.7%	0%	162%
			Preferential Margins			
Affected by graduations	Pre-graduation	4,736	4.5%	2.6%	0.7%	114%
	Post-graduation	2,982	0%	0%	0%	0%
	Total	7,718	2.6%	3.6%	0%	106%
Full sample		778,352	4.1%	4.9%	0%	162%
			Competitiveness: product import shares			
Affected by graduations	In bottom 4 quintiles	3,090	1.3%	1.4%	0%	5.5%
	In top quintile	3,941	35.2%	25.9%	5.6%	100%
	Total	7,031	20.3%	25.7%	0%	100%
Full sample	Bottom 4 quintiles	369,548	0.51%	1.0%	0%	5.6%
	Top quintile	63,043	32.2%	28.9%	5.6%	100%
	Total	432,591	5.1%	15.7%	0%	100%

Sample for analysis of spillover effects						
			EU imports, in million Euro			
Non-GSP eligible products	Close products within 6-digit groups	727	28.72	233.51	0	3,205
	Close products within 4-digit groups	1,385	16.18	169.75	0	3,205
	Full sample	156,481	4.22	167.92	0	28,618

Source: authors' elaboration

Lastly, Table 2 also reports figures on the observations we use to assess whether the effect of graduations spills-over on non-affected products. This sample is very different from that used in the rest of the paper, as is it composed entirely of products not eligible for GSP tariffs (recall, we

[19] The full sample of 778,352 observations is slightly smaller than the grand total of observations in the treated and control groups, respectively, due to a partial overlap between two of the control groups, namely *unaffected* products in *affected* countries (e.g., observations of a non-graduated section for India (17-a) as India was affected by graduations in other sections) and *affected* products in *unaffected* countries (those same observations if that section was graduated elsewhere, e.g. 17-a was graduated in Ukraine).

did not include these products in the main estimation sample). We define closely-related products at a certain level (e.g. at the 6-digit level) those 8-digit products that are not-GSP eligible but belong to the same (say, 6-digit) group as some GSP-eligible products. The number of closely related products is smaller the more detailed the level of analysis, of course.

4.3. Estimation Strategy

There are several dimensions and sources of variation in the data that can be exploited to estimate the trade impact of competitiveness-related graduations. Other than the pre-/post-2014 period changes, for tighter identification we use the fact that graduations apply only to specific countries, and to the products belonging to specific sections.

We begin by estimating a difference-in-difference model that compares trade changes between affected and non-affected products exported by affected countries, namely India, Indonesia, Nigeria, and Ukraine, respectively, pre- and post-2014. For this we use the sample of all GSP eligible products shipped by countries that were affected by graduations, and estimate the following model:

$$imp_{k,i,t}^{EU} = exp\left(\beta_1 grad_{k,i,t}^{2014} + \ln(tariff)_{kit} + \theta_{k,i} + \vartheta_{i,t}\right) + \varepsilon_{k,i,t} \quad (1)$$

where $imp_{k,i,t}^{EU}$ denotes EU imports of product *k* from country *i* in year *t*. $grad_{k,i,t}^{2014}$ denotes a binary variable taking value 1 if the product is graduated in 2014, and zero otherwise. $\ln(tariff)_{kit}$ denotes the log of the EU's average tariff rate at the CN-8 product level *k* in year *t* applied towards imports from country *i*. Variables $\theta_{k,i}$ and ϑ_{it} denote, respectively, country-product and country-year fixed effects. Country-product fixed effects will absorb EU tariff rates to the extent that they are time-invariant. The coefficient β_1 captures the effect of preferences removal on EU imports of graduated products relative to non-affected products.

Next, we compare trade changes between affected and non-affected countries shipping products affected by graduations in 2014. This implies estimating a second difference-in-difference model based upon a sample that includes products that were subject to graduation, exported to the EU by all countries that were members of the EU GSP scheme, some of which were subject to graduation but not others. For this exercise we estimate the following equation:

$$imp_{k,i,t}^{EU} = exp\left(\beta_1 grad_{k,i,t}^{2014} + \ln(tariff)_{kit} + \theta_{k,i} + \mu_{k,t}\right) + \varepsilon_{k,i,t} \quad (2)$$

where the dependent and independent variables are defined as in equation 1. Variables $\theta_{k,i}$ and $\mu_{k,t}$ denote, respectively, product-country and product-year fixed effects. The latter set of fixed

effects will absorb EU tariffs to the extent that GSP rates do not vary across groups of beneficiaries (i.e. within GSP sub-schemes).[20]

Equations (1) and (2) appear to be nearly identical but we emphasise again that they are applied to different samples and rely on a different kind of variation for identification. In equation (1), the graduation effect is identified by comparing changes over time in graduated vs unaffected products, within countries. This represents an appropriate specification if one thought that differences across products are random and any confounding effects are country-specific. By contrast, in equation (2) the graduation effect is estimated off changes over time in export values from graduated vs non-graduated exporting counties, for a given product. This model, in turn, is therefore appropriate if one thought that graduated products might be systematically different from non-graduated products.

Finally, we estimate a triple-difference model that exploits all sources of variation in the data and compares trade changes for affected products from affected countries with those of non-affected products from non-affected countries, pre- and post-graduation. This exercise (equation 3) uses the full sample of all GSP eligible products shipped by all GSP members, i.e. the full sample as described in section 4.2. Compared to the two diff-in-diff models in equations (1) and (2), this specification affords a much higher number of observations to be exploited, thereby increasing substantially the scope for precise identification of the effect of interest:

$$imp_{k,i,t}^{EU} = exp\left(\beta_1 grad_{k,i,t}^{2014} + \theta_{k,i} + \vartheta_{i,t} + \mu_{k,i}\right) + \varepsilon_{k,i.,t} \qquad (3)$$

Where the dependent and independent variables are defined as in equation (1). Variables $\theta_{k,i}$, $\vartheta_{i,t}$ and $\mu_{k,t}$ denote sets of, respectively, product-country, country-year, and product-year fixed effects.[21]

The triple-difference specification is the most robust of the three we have described, as it exploits the full sample of data and controls for unobservable confounding factors at various levels. It is also the theoretically most defensible specification against the backdrop of classical comparative advantage being a country-sector (or country-product) characteristic. Indeed, it is instructive to compare the results from the triple difference specification with that of the two double-differences

[20] Product-year fixed effects will not fully capture time-varying differential EU import tariffs for GSP vs GSP+ or EBA beneficiaries, respectively. Notice also that less-than-full utilisation rates of preferences (see Hakobyan 2015) will *de facto* imply different applied tariffs across and within countries, and as such this would also not be fully captured by product-year fixed effects.

[21] As the graduations occur at the country-section level, as a robustness check, we estimate specifications (1)-(4) by exploiting country-section fixed effects instead of country fixed effects. The results are extremely similar to those presented in the paper, and are available upon request from the authors.

models, to gauge which source of variation exerts a relatively stronger effect on trade or, put differently, which dimension as between countries and products is the main comparative advantage force that eventually leads to graduation. As we will see, the double-difference model exploiting changes across products within a given country will typically yield similar results to the triple-difference model. This is mostly driven by India as the largest among the affected countries in our sample, and suggests that for Indian firms preferences make a difference as for which products to produce and trade. By contrast, for smaller and more specialized countries (Indonesia, Nigeria and Ukraine) cross-country differences that are relevant for exports of a particular product (such as technology, endowments, or institutions) are the main drivers behind the graduation results.[22]

All models are estimated using the Pseudo-Poisson Maximum Likelihood estimator developed by Correia et al. (2019), which allows us to retain the zero trade flow observations in estimation and to account for potential heteroscedasticity issues. Finally, inference is always based on standard errors clustered at the country-product pair level. Our results are fully robust to alternative clustering, at the two-way country and product level.[23]

5. Results

5.1. Main Findings

We find that EU imports of affected products experience a large and significant drop in value following a graduation (Table 3). In our preferred estimation (column 3) using a triple difference setup, graduations are associated with a fall in EU imports by on average 31% ($e^{(-0.340)} - 1 = -0.28$), relative to the control group. The magnitude of this effect is substantial, especially as it is obtained as an average for a wide range of products covered by a GSP section and being conditional on EU tariffs, which themselves exert a strong and highly significant effect. Put differently, the fall by 31% reflects the pure effect of a relative deterioration of market access as between different country-product combinations over time, net of product-level tariff rates.[24] The

[22] From a microeconomic perspective and depending on the theoretical model one may have in mind, firms have several margins of adjustment to stay competitive after being graduated out of preferential market access, including potentially to lower their mark-ups in variable markup models. These and other hypotheses could only be investigated with firm-level data.

[23] We chose to present results based on country-product clustered standard errors merely because, in some of the double-difference models, the two-way clustering is based on a very small number of clusters.

[24] In a roughly comparable setting of triple difference estimation, Hakobyan (2020) finds a much more modest fall in US imports of about 3% following the (non-selective) expiration of the entire US GSP program. In the case of US CNL tariff revocations, Hakobyan (2017) obtains positive estimates of trade effects in double and triple difference specifications.

large drop in trade after a graduation episode thus illustrates the relevance of the competitive advantage offered by trade preferences to GSP beneficiaries.

We also find that the effect estimated from cross-product variation within affected countries (-28%, in column 1) is nearly identical to the triple difference model, whereas the effect that arises from cross-country variation within affected product is less (15%, in column 2) and statistically insignificant. This suggests that the main driver of graduation effects are differential changes in exports to the EU pre-/post preference removal from products that experience graduation relative to unaffected products within the same country.

Table 3: Trade effects of country-section graduations on EU imports

	(1)	(2)	(3)
Model	Diff-in-Diff: grad. v. non-grad. products	Diff-in-Diff: affected v. non-affected countries	Triple difference
Sample	GSP eligible products, affected countries	Graduated products, all countries	GSP eligible products, all countries
Graduation	-0.340	-0.165	-0.340***
	(0.224)	(0.201)	(0.0953)
Ln(tariff)	2.665	-6.793	-1.927***
	(5.068)	(4.743)	(0.515)
Country-product FE	Y	Y	Y
Country-year FE	Y		Y
Product-year FE		Y	Y
N	129,197	66,010	778,352

Note: Standard errors clustered at the country-product level in parentheses. * p < 0.1, ** p<0.05, *** p<0.01.

Because the loss of preferential market access imparted by the 2014 reform that we exploit in this paper could hardly have been foreseen, it is reasonable to expect that the surprise graduations' impact on trade requires some time to fully unfold. Therefore, we explore how the effect of graduations varies over time (Table 4) by allowing for annual changes in the coefficients, i.e. we interact binary variables for each post-graduation year in our data (i.e. 2014-2016) with the main regressor identifying affected products and countries.

We find an immediate the effect of graduations on trade, with a significant drop in EU imports in the first year (-17%), and subsequently a monotonic rise of the adverse effect over time: in the third year post-graduations, EU imports of affected products are 35% lower relative to the control group (column 3: $e^{(-0.434)} - 1 = -0.352$). Again, we find that the triple-difference results in column 3 are close to the double-difference ones in column 1.

As the nine surprise graduations spread over four beneficiary countries (see Table 1), we explore whether there are noticeable differences in the trade impacts of graduations across the affected economies in the treatment group. For this we construct four binary variables identifying EU

imports of the countries affected by graduations, and we interact them with the main regressors identifying graduated products. Results are shown in Table 5.

Table 4: effect of country-section graduations on EU imports–- effect over time

	(1)	(2)	(3)
Model	Diff-in-Diff: grad. v. non-grad. products	Diff-in-Diff: affected v. non-affected countries	Triple difference
Sample	GSP eligible products, affected countries	Graduated products, all countries	GSP eligible products, all countries
Grad. * T=1	-0.334'	0.00485	-0.189*
	(0.226)	(0.202)	(0.101)
Grad. * T=2	-0.339'	-0.197	-0.384***
	(0.232)	(0.223)	(0.133)
Grad. * T=3	-0.348'	-0.289	-0.434***
	(0.218)	(0.214)	(0.119)
Ln(tariff)	2.664	-6.812	-1.948***
	(5.067)	(4.753)	(0.514)
Country-product FE	Y	Y	Y
Country-year FE	Y		Y
Product-year FE		Y	Y
N	129,197	66,010	778,352

Note: Standard errors clustered at the country-product level in parentheses. * p < 0.1, ** p<0.05, *** p<0.01.

Focusing on the triple-difference estimates, we find the largest effects for Nigeria (-67%) and the smallest, relatively speaking but still quite sizable, effect for India (-24%). The estimate for India is the closest to the average effect detected in Table 1, due to India being the largest GSP beneficiary and the country most affected by graduations in 2014. For all countries except India, the double-difference results across countries (column 2) are closer to the triple difference estimate than the double-difference results across-products (column 1). This suggest that somewhat different dynamics at are work in these countries. On the one hand, for Indonesia, Nigeria and Ukraine preferences help overcome cross-country differences (such as technology, endowments, or institutions) that are relevant for exports of a particular product. On the other hand, for India as a large economy GSP preferences make a difference in stimulating exports of particular products over other products, while the country's export performance in affected products relative to competitor countries is largely unaffected by graduations.

Before concluding this section, it is worth noting that our findings are different, at the very least in their interpretation, from those found by Hakobyan (2017) for CNL exclusions from the US GSP. Hakobyan finds a large negative drop in imports of affected products relative their pre-CNL mean but obtains a positive estimate when a triple difference estimator is employed. Furthermore, it is important to note that US CNLs only target (potentially) competitive products at a very

detailed level whereas EU GSP graduations hit a broad range of products falling within the purview of graduated GSP sections with widely different import shares and preference margins, respectively.

Table 5: effect of country-section graduations on EU imports – effects by country

	(1)	(2)	(3)
Model	Diff-in-Diff: grad. v. non-grad. products	Diff-in-Diff: affected v. non-affected countries	Triple difference
Sample	GSP eligible products, affected countries	Graduated products, all countries	GSP eligible products, all countries
India	-0.252	-0.0790	-0.275***
	(0.252)	(0.200)	(0.0972)
Indonesia	-0.980	-0.611	-0.671*
	(0.732)	(0.440)	(0.402)
Nigeria	-0.774	-1.249***	-1.129***
	(0.558)	(0.244)	(0.227)
Ukraine	-1.182*	-0.494***	-0.481***
	(0.611)	(0.162)	(0.135)
Ln(tariff)	3.211	-6.816	-1.974***
	(4.213)	(4.748)	(0.513)
Country-product FE	Y	Y	Y
Country-year FE	Y		Y
Product-year FE		Y	Y
N	129,197	66,010	778,352

Note: two-way clustered standard errors, at the country and product level, in parentheses. * p < 0.1, ** p<0.05, *** p<0.01.

5.2. Effects Heterogeneity and Spillovers

5.2.1. Preferential Margins

In this section we investigate additional aspects that shed further light on the forces that shape the substantial fall in EU imports post-graduation. We begin by exploring if the effect of graduation varies depending on the size of the preference margin that was offered under GSP with respect to the MFN tariff. Put differently, we would like to know whether products that used to benefit from a larger 'advantage' over their non-GSP competitors, in the form of a lower import tariff in the EU, are affected differently by the graduation relative to products whose GSP tariff was closer to the MFN. Our prior is that a larger margin was likely to have supported the trade performance of exporters in developing countries more strongly, thereby leading to a larger contraction in trade if preferences were revoked.

We interact the main regressor identifying graduated products with two mutually exclusive binary variables that separate the treatment group into products whose pre-reform preferential margin

was below the median—among the products imported from affected countries—from those products with above-median margins. We find that the effect of graduation is entirely driven by the subgroup of products with an above-median pre-reform preferential margin (Table 6).
For those products, graduation results in 33% lower trade (column 3) in the absence of the substantial margins enjoyed previously. It is perhaps not surprising to see that those products with larger preference margins drive the result; however, it is nonetheless instructive to find that *only* products whose trade performance was importantly sustained by the preferences suffer from the loss of the latter, and that this effect already accounts for any potential changes in tariffs.

Table 6: effect of graduations on EU imports – effects by preferential margin groups

	(1)	(2)	(3)
Model	Diff-in-Diff: grad. v. non-grad. products	Diff-in-Diff: affected v. non-affected countries	Triple difference
Sample	GSP eligible products, affected countries	Graduated products, all countries	GSP eligible products, all countries
Grad. * Below med. margin	0.0361	-0.0142	-0.144
	(0.280)	(0.208)	(0.169)
Grad. * Above med. margin	-0.479**	-0.249	-0.408***
	(0.207)	(0.243)	(0.112)
Ln(tariff)	4.570	-6.149	-1.892***
	(4.637)	(5.013)	(0.515)
Country-product FE	Y	Y	Y
Country-year FE	Y		Y
Product-year FE		Y	Y
N	124,403	65,949	775,988

Note: two-way clustered standard errors, at the country and product level, in parentheses. * p < 0.1, ** p<0.05, *** p<0.01.

5.2.2. Do Section-wide Graduations Generate Collateral Damage?

Under EU GSP rules competitiveness is defined at the broad country-section level, according to the share of imports out to the total in that GSP section from all beneficiaries. A high share of imports could be driven by a subgroup of products within that GSP section that is very competitive whereas other products might instead not be competitive at all, yet these products get caught up in a graduation simply because they belong to the same GSP section as the competitive ones. In that sense, section-level graduations could create some 'collateral damage' in case trade of low-competitiveness products was negatively affected.

We investigate this hypotheses by constructing a measure of competitiveness in the EU market at the 8-digit product level, akin to the one constructed by the EU at the section level, i.e. the share of EU imports of an 8-digit product from a GSP member out of total EU imports of that product

from all GSP members.[25] We then separate the impact of graduations between high-competitiveness products, which we define as those in the top-quintile of the product-level import-share distribution, and products in the rest of the distribution (i.e. the bottom four quintiles).[26]

Indeed, we find that the negative trade effect of graduations is driven by the high-competitiveness group (Panel A of Table 7). This does suggest that graduations target the 'right' products and generate little collateral damage. In column (3), we find a negative impact of -22.7% on the products in the top quintile of the competitiveness distribution.[27]

After having established that only those products with the relatively highest import shares in the EU suffer a fall post-graduation, we proceed to investigate whether that negative impact ranges uniformly across all these products or whether high import shares are tied to high preference margins (Table 6). In other words, a high import share could be due to genuine cost competitiveness or could hinge solely on the preferential market access. In the former case, we would not expect graduation to have any noticeable effect on such products whereas the lapse of preferential market access would hit the latter kind of products hard. Empirically, we combine the approaches in Tables 6 and Panel A of Table 7 and interact the indicators denoting products' competitiveness with those separating products depending on their pre-reform preferential margins.

We find that only imports of products with relatively high import shares *and* with an above median pre-reform preference margin fall after a graduation (Panel B in Table 7). At the same time, neither are products with high import shares but low preference margins affected nor are products with small imports share that nonetheless enjoy large margins. These results yield two insights: firstly, only products whose export success to the EU is propped up by a substantial preference margin falter when such preferential market access conditions are removed, whereas products that exhibit high import shares despite below-median margins are unaffected by graduations. Secondly, equally

[25] We use data over the 2009-2011 period to compute these shares, for compatibility with the section-level graduations shares. Also, we only use positive trade flows observations for the calculation of the product import-shares, i.e., we do not use zero trade flows observations. This is because we mimic the calculation made by the EU when computing section-level shares and, since the EU calculation involves computing yearly shares that are then averaged over the three-year period, including zero-trade flows (which would take a share of zero) alters the final average values. All this results in a reduced sample available for the exercise on the product-import shares. The main results are robust to using this reduced sample, however.

[26] Note that import shares are product-specific across all beneficiary countries; hence, if EU imports of a product that accounted for a large value of imports were distributed evenly across developing country exporters, those import-shares would still be low. Therefore, products that drive the substantial fall in EU imports do not fall within the top quintile of the import share distribution by construction.

[27] This impact is smaller than the average estimated on all products (-28%, column 3 of Table 3), which would be difficult to reconcile with the former being obtained on a subsample of products only. However, estimates in Table 7 are obtained on a smaller sample than that used in Table 3. Re-running the models of Table 3 on the reduced sample yields an average impact of graduations of -21% (see Appendix Table A1) which is below the coefficient obtained for high-competitiveness products only.

unaffected are products with large margins that nonetheless record small import shares. This finding admits a better, more detailed understanding of the result in Table 6 and shows that there is little 'collateral damage' resulting from graduations at the section level.

Table 7: effect of country-section graduations on EU imports by competitiveness groups

	(1)	(2)	(3)
Model	Diff-in-Diff: grad. v. non-grad. products	Diff-in-Diff: affected v. non-affected countries	Triple difference
Sample	GSP eligible products, aff. countries	Graduated products, all countries	GSP eligible products, all countries
Panel A			
Imp. Sh., 1st-4th Quintiles	0.166	0.0328	-0.0772
	(0.245)	(0.266)	(0.208)
Imp. Sh., 5th Quintile	-0.35''	-0.0779	-0.258***
	(0.224)	(0.205)	(0.0990)
Ln(tariff)	2.705	-6.90''	-2.257***
	(5.040)	(4.783)	(0.505)
Panel B			
Imp. Sh., 1st-4th Quintiles * Below med. margin	0.0244	-0.0866	-0.182
	(0.221)	(0.326)	(0.292)
Imp. Sh., 1st-4th Quintiles * Above med. margin	0.0919	-0.00146	-0.0697
	(0.259)	(0.314)	(0.245)
Imp. Sh., 5th Quintile * Below med. margin	0.0351	0.234	0.0958
	(0.289)	(0.187)	(0.153)
Imp. Sh., 5th Quintile * Above med. margin	-0.488**	-0.222	-0.367***
	(0.205)	(0.246)	(0.115)
Ln(tariff)	4.573	-5.908	-2.207***
	(4.606)	(5.030)	(0.506)
Country-product FE	Y	Y	Y
Country-year FE	Y		Y
Product-year FE		Y	Y
N	106,174	35,370	425,525

Note: two-way clustered standard errors, at the country and product level, in parentheses. * p < 0.1, ** p<0.05, *** p<0.01.

The normative interpretation of these findings is nuanced. Products with small imports shares do not seem to get caught up in graduations, irrespective of the size of their preferential tariff margin, and the absence of such 'collateral damage' is positive. Likewise, there are products whose export success to the EU does not hinge on large preference margins, and these products seem to have come through graduation pretty much unscathed. The adverse effect on trade of graduations is borne solely by those products that had large preference margins and high import shares. This could be interpreted as rather devastating because graduations are found to bite where it hurts

beneficiary countries the most, namely products for which the GSP enabled export success. Evidently these products have not yet reached the stage of genuine competitiveness, or else they would have reacted to a graduation in a similar way as those with equally high import shares but little support from preferential margins. Thus, overall, we interpret these findings as suggesting that "competitiveness-related" graduations may in fact be premature and hit products that are in fact not yet competitive.

5.2.3. Spillovers to Non-graduated Products

A feature of section-level graduations is that firms affected by preferences removal have little chance to avoid the increase in tariffs by shifting production to non-affected products, as graduations are imposed on wide product categories (e.g. live animals, textiles, motor vehicles). In case graduations were targeted to more narrowly defined products, as in the US GSP, producers could potentially try to retain preferential market access by re-orienting resources from graduated to still eligible non-graduated products, but this is unlikely to happen from graduated to non-graduated GSP sections in the EU scheme.

However, even though graduations occur at the level of the 32 GSP sections, product eligibility is defined at the 8-digit level, with the fraction of eligible products covered by a GSP section not being exhaustive of the products in the classification such as, for instance, in the HS-sections.[28] For instance, in some of the HS-sections[29], such as in textiles (HS section 11) or footwear (HS section 12), the fraction of 8-digit products eligible for GSP is high and close to 100%, whereas in other HS-sections there is more variety in terms of GSP eligibility. For instance, in HS section 1 (Live animals and animal products, covering the EU GSP sections 1a and 1b), only approximately 50% of the 8-digit tariff lines are eligible for GSP, whereas in HS section 5 (Mineral products), coinciding with section 5 in the EU GSP, 25% of the tariff lines are eligible for GSP.

In these latter cases, therefore, one can find several rather narrow product groups (e.g. an HS 6-digit or HS 4-digit group) that encompasses both GSP eligible and non-GSP eligible products (see footnote 5 for an example about processed meat), with graduations affecting market access in the EU only for eligible products. In these circumstances, the impact of graduations might spill-over to closely-related non-graduated (because non-eligible) products. The sign of this effect would be ambiguous, however, as two distinct forces might be at play: on the one hand, the spillover effect

[28] All the products in the HS classification are allocated to one of the 21 HS-sections, and in that sense the HS-sections are an exhaustive partition of all the products in the classification. GSP sections include only a fraction of products (about 66% of the tariff lines at the 8-digit level).
[29] These are the 21 sections of the HS classifications.

would be positive if firms were willing and able to re-orient resources away from graduated products towards the production and trade of non-graduated products, e.g. because of existing production capabilities that cover all products of an HS-4 digit or 6-digit group. On the other hand, graduations might result in negative trade effects also for the non-graduated products exported by the affected firms if there were fixed costs to exporting that straddled several product varieties and exporting of non-graduated products alone was no longer profitable.

The investigation of this hypothesis would ideally necessitate firm level-trade data, to identify multi-product firms and accurately verify the presence of negative cross-products spillovers. That said, we nonetheless attempt to provide an indication of the likely existence of such spillovers with product-level data at our disposal noting that, if an effect was detected, it could be considered a lower bound estimate of the true effect.[30]

For this exercise we construct a variable at the country-product-year level, identifying the 8-digit products not affected by graduations within 4-digit and 6-digit groups that include products that graduated in 2014. Next, we estimate specifications analogous to equations (1)-(3) above, by which we estimate the effect of the 2014 graduations on *closely-related non-affected* products, relative to *not-closely related non-affected* products and *closely-related products imported from non-affected countries*. Hence, the estimation is carried out on a sample of non-GSP eligible products (i.e. not formally affected by graduations) and compares trade changes between products closely and not-closely related to those that graduated in 2014. Formally, the triple-difference specification for this exercise is:

$$imp_{k,i,t}^{EU,noGSP} = exp\left(\beta_1 close_{k,i,t}^{2014} + \theta_{k,i} + \vartheta_{it} + \mu_{ki}\right) + \varepsilon_{k,i.,t} \qquad (3)$$

where the dependent variable is EU imports of non-GSP eligible product *k* imported by country *i* in year *t*, and $close_{k,i,t}^{2014}$ denotes a binary variable taking value 1 if a product is in a 4-digit or a 6-digit group including 8-digit products that graduated in 2014. Table 8 presents the estimation results.

We find positive spillovers of graduations in our triple-difference estimates, in which the trade performance of closely-related non-affected products is compared to both that of less-closely-related products shipped by affected countries, and closely-related products shipped by unaffected

[30] This is because product level data aggregate information for multiple firms and clearly mask some of the heterogeneous responses between firms both within and between product groups.

countries.[31] Here the trade increase is estimated to be rather large (+95.6%) and, for the indicator identifying close-products within 4-digit group, statistically significant at the 10 percent level.

Table 8: effect of graduations on EU imports of closely-related non-affected products

	(1)	(2)
Model	Triple difference	
Sample	All non-GSP eligible products, all countries	
HS level of 'close' products groups	6-digit	4-digit
Close products	0.857'	0.671*
	(0.557)	(0.363)
Country-product FE	Y	Y
Country-year FE	Y	Y
Product-year FE	Y	Y
N	156,481	156,481

Note: two-way clustered standard errors, at the country and product level, in parentheses. * p < 0.1, ** p<0.05, *** p<0.01.

Results in Table 8 are indicative of firms' potentially trying to respond to the effect of being graduated by shifting resources away from production of graduated products towards products whose trading conditions are unchanged, even if those products are not eligible for preferential tariff treatment in the destination market.

[31] We only show the effect estimated in the triple-difference model here, for conciseness. Results appear to be driven by cross-country difference between the closely-related products, rather than between closely and non-closely related products within affected countries.

6. Conclusion

Generalised System of Preferences (GSP) schemes deliberately create a distortion in import prices with a view towards helping specific developing countries to enhance and diversify their export performance. This begs two principal questions: do these interventions achieve their stated goals? And what happens when this well-intentioned distortion is removed again? The fact that both the award and the removal of such tariff preferences is typically known in advance complicates the investigation of trade impacts considerably.

This paper focuses on the second question, on which much less is known compared to the first question that has been studied by a well-established literature. It is the first to offer comprehensive evidence about the trade effects on developing country beneficiaries when preferential market access to the European Union (EU) is revoked for some of their products. We exploit a reform of the EU GSP programme that led to 'graduations' of specific products from four beneficiary countries (India, Indonesia, Nigeria and Ukraine) that could hardly have been anticipated.

Our analysis offer three main findings. Firstly, the value of imports falls substantially, on average by 35% three years after graduation, based upon a demanding triple-difference estimation, with considerable variation of trade impacts across the four countries affected. Secondly, the dramatic fall in import values is partly a consequence of the fact that the graduated products had not achieved genuine competitiveness in the EU market but instead hinged on sizable preference margins. Products that are successful in the sense of high import shares are negatively affected by graduations only if they benefited from a high preferential margin pre-graduation, whereas high import share products with small preference margins are unaffected. Thirdly, the adverse direct impact of graduations is partially attenuated by the ability of developing country exporters to redirect production towards closely related but unaffected products, whose EU imports nearly double post-graduation relative to imports of other non-graduated products.

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Appendix

Estimates on reduced-sample of products for which it is possible to compute an import-share measure.

Table A1: Trade effects of country-section graduations on EU imports – reduced sample

	(1)	(2)	(3)
Model	Diff-in-Diff: grad. v. non-grad. products	Diff-in-Diff: affected v. non-affected countries	Triple difference
Sample	GSP eligible products, affected countries	Graduated products, all countries	GSP eligible products, all countries
Graduation	-0.320	-0.0674	-0.240**
	(0.226)	(0.203)	(0.0954)
Ln(tariff)	2.118	-6.901'	-2.249***
	(5.004)	(4.791)	(0.505)
Country-product FE	Y	Y	Y
Country-year FE	Y		Y
Product-year FE		Y	Y
N	103906	35362	425525

Note: Standard errors clustered at the country- product level in parentheses. * p < 0.1, ** p<0.05, *** p<0.01.

Figure A1: distribution of import-shares computed at the product level.

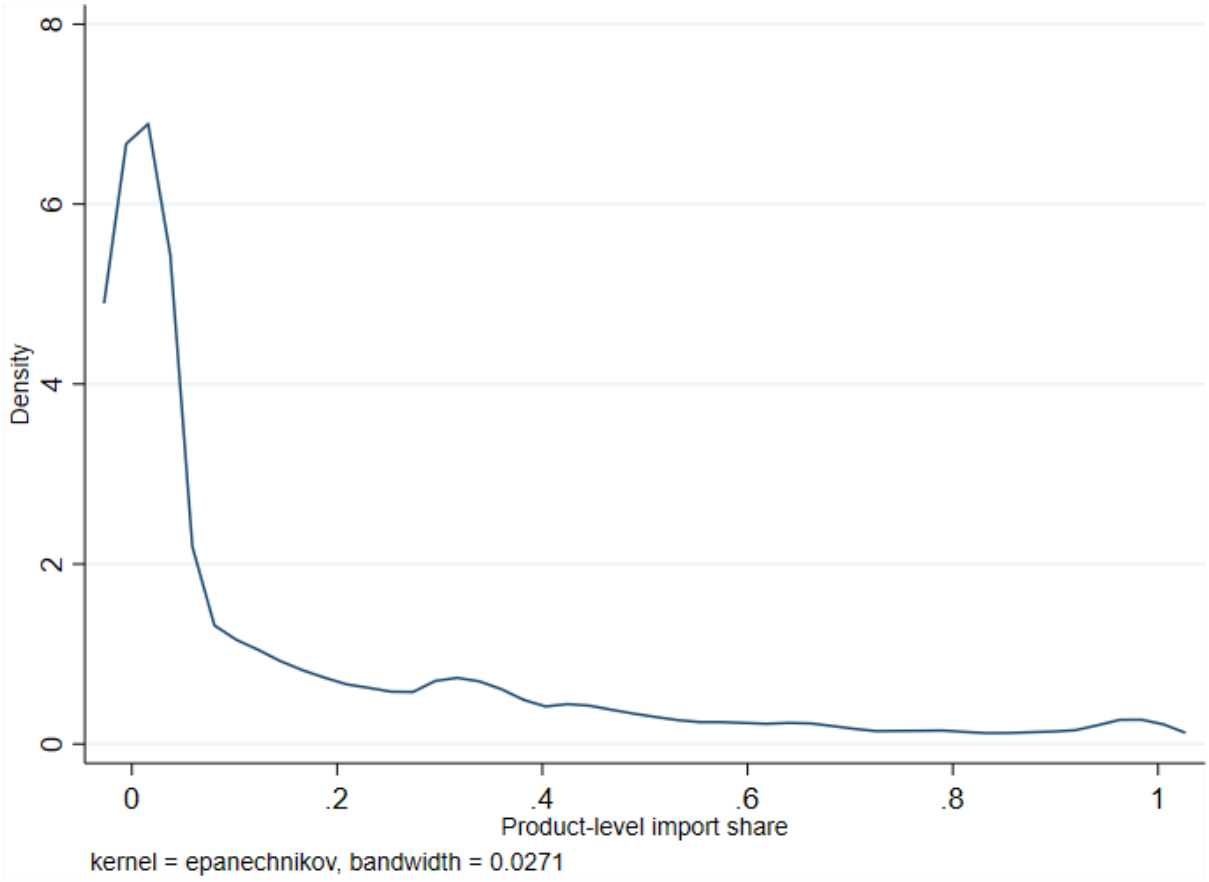

Table A2: List of GSP members

Standard GSP	GSP+	EBA	
Congo	Armenia	Afghanistan	Madagascar
Cook Islands	Bolivia	Angola	Malawi
India	Cabo Verde	Bangladesh	Mali
Indonesia	Kyrgyz Republic	Benin	Mauritania
Kenya	Mongolia	Bhutan	Mozambique
Micronesia	Pakistan	Burkina Faso	Myanmar
Nauru	Philippines	Burundi	Nepal
Nigeria	Sri Lanka	Cambodia	Niger
Niue		Central African Rep.	Rwanda
Samoa		Chad	Sao Tome and Principe
Syria		Comoros	Senegal
Tajikistan		Congo (Dem. Rep.)	Sierra Leone
Tonga		Djibouti	Solomon Islands
Uzbekistan		Equatorial Guinea	Somalia
Vietnam		Eritrea	South Sudan
		Ethiopia	Sudan
		Gambia	Tanzania
		Guinea	Timor-Leste
		Guinea Bissau	Togo
		Haiti	Tuvalu
		Kiribati	Uganda
		Laos	Vanuatu
		Lesotho	Yemen
		Liberia	Zambia

Source: authors' elaboration