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of Preferences (GSP) scheme is its graduation mechanism, whereby preferential market access for imports to the EU is withdrawn from beneficiaries in sectors in which they are considered to be sufficiently competitive.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 nearly double as developing country exporters redirect production towards non-graduated products.

JEL codes: F13, F14, F15, F63

Key words: GSP, graduations, trade policy, preferences

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1. Introduhrd

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 28 to 29 by 2 years.

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 a 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, 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 performa24 Tw [(')-2 (d [(c)1 ()-2 (-1 (e)1 (r)-

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; Forge et al., 2021), and in particular to those studies that analyse the impact of preference removal (Devault, 1996; Hakobyan, 2017, 2020; Albornoz et al., 2020; 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 (the Competitive Needs Limit). She too finds US imports of the affected products to fall, whereas the shares of other GSP members' and 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 the discusses 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-

product eligibility and membership (Ornelas and Ritel, 2020). Furthermore, the aggregated nature of the aforementioned studies masks 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 sector- or product-level data. Among these, Frazer and Van Biesebroeck (2010) find that NRTPs offered under the African Growth and Opportunity Act (AGOA) increased 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 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 27%. 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 applied to Argentinian products in 1997. The permanent suspension of these 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 (rm)]TJ 0Sl0(a d)2 (me)]Tw (US)Tj -3 (o)-1 -1 (f)-3 (o

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 setting that is slightly different as it relates to the (temporary) expiration of the entire US GSP program and thus affects all eligible products at once, 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 8% with persistent effects. Hakobyan (2017) is the paper closest to ours because it examines the effect of selective exclusions due to GSP's Competitive Needs Limit (CNL), a feature of the GSP that revokes preferential tariffs for 'super competitive products'. This definition is met when the amount od [(GS22)-3(S)-2 1 forar1 (s)-1 (t)-1

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 low- and lower-middle-income countries[8] that do not have an alternative preferential trade arrangement with the EU. The EU GSP 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 in most 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. These 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 2011-2013 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

various elements of the scheme that triggered a number of remarkably 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 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 import-shares 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.

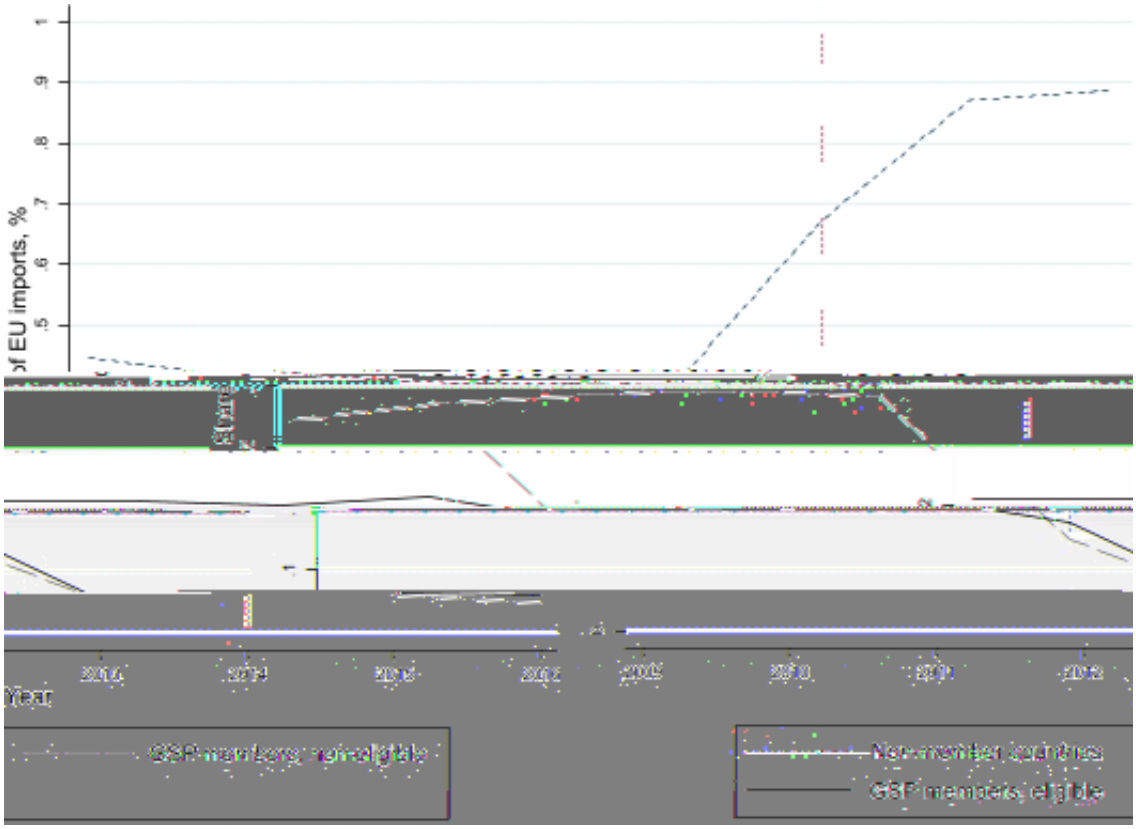
Table 1: 2014 country-section graduations used in analysis

Country	Section	Value (€m)	% aff.	Expected imp. share

The 2014 reform triggered nine 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. These products account for a share of EU imports in the range of 85-95% over the 2009-2016 period,

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 in 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 EUCOMEXT. 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, for instance, ensure that changes in the membership are correctly tracked over time, to differentiate among the various reasons for 2-1 (h)-1.1 (i)-2 E(r)-2 M (e)C2 (sponds t)-1 (g)s1r / P

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				

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 GSP eligible products shipped by countries that were affected by graduations, and estimate the following model

$$EIL_{P,Üç}^{¾,Î} = A\,TKÚ_5\,CN_{G,EP}^{2014}\,@ + \ln(P = NE)\,BB_{P,Ü}\,à_{P,Ü} + ô_{Üç}\,o + Ý_{P,Üç} \qquad (1)$$

where $EIL_{P,Üç}^{¾,Î}$ denotes EU imports of product k from country i in year t. $CN_{P,Üç}^{6,4,5,8}$ denotes a

effects will absorb EU tariffs to the extent that

large drop in trade after a graduation episode 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 products 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		

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 (-1 = 133) 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, al 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)	(0.1 2 -0f 9 -5.12 5

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 mutually exclusive binary variables that separate the treatment group into products whose pre-reform preferential margin

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 loss 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 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 des

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 e Q 8 116.56

(1) (2) (3)

beneficiary countries the most, namely products for which the GSP enabled export success.

would be positive if firms were willing and able to reorient 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 of 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 data, to identify multi-product firms and accurately verify the presence of negative cross-product 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 -4 (t)t a -44bu-1 (s)-1 w (ae)1 (c)-g6(e)2 (c (g)-3 ( )-2 (-(at)1 ( )-5 (t.-5 (-

countries.[31] Here the trade increase is estimated to be rather large (+95.6%) and 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	

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 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

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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, al 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)

Table A2: List of GSP members