

GSP Expiration and Declining Exports from Developing Countries*

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Abstract

This paper investigates whether the 2011 expiration of the most comprehensive trade preference program (Generalized System of Preferences or GSP) offered by the US had a detrimental impact on the exports from developing countries. The effect of GSP expiration is examined with a triple difference-in-differences estimation that controls for both country- and product-level export changes. Even though the duties collected during the period of expiration are ultimately refunded after GSP is reauthorized, the findings of this paper suggest that the expiration of GSP had a considerable impact on the level of exports to the US. On average exports dropped by 3 percent in 2011, with exports of agricultural products and textiles and clothing declining as much as 5 and 9 percent, respectively. The decline is increasing in the tariff rates and rates of utilization. The effect appears to be persistent over time as exports do not fully recover by 2012. The 2011 expiration is also found to be similar in magnitude to 1995-96 and 2013-15 expirations, the longest episodes of expiration in the history of the GSP.

Keywords: Generalized System of Preferences (GSP), GSP expiration, exports from developing countries

JEL Classifications: F13, O19

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“So, what’s the impact [of GSP expiration]? Well, the actual amount of goods coming in through the GSP program is relatively small, at \$19 billion in 2012 (or just about 2 percent of U.S. imports). And theoretically, the tariffs get refunded when the program is finally reauthorized, so no big deal, right?”

– The Washington Post, August 12, 2013

1 Introduction

Preferential market access is of critical importance to many exporters in developing countries. And a number of developed countries provide preferential including duty-free access to their markets to stimulate exports from developing countries. About one-third of dutiable exports from developing countries to the US are eligible for the Generalized System of Preferences (GSP), the most comprehensive (in terms of country coverage) trade preference program offered by the US.

Notwithstanding the preferential treatment, the existing literature identifies a number of factors that may inhibit the exports from developing countries or lead to low take-up rates under GSP. Examples include stringent rules of origin requirements and eroding preference margins (Hakobyan, 2015; Francois et al., 2006; Reynolds, 2009). An additional hurdle to the utilization of the program, often overlooked in the literature, is its frequent expiration; GSP is not a permanent program and needs to be periodically renewed by the Congress. And even though the duties paid during the periods of expiration have traditionally been reimbursed after the retroactive re-authorization of GSP, the unexpected expiration of benefits may have detrimental effects particularly on small exporters whose costs rise suddenly for an uncertain period of time. Furthermore, the frequent expiration of benefits may also raise uncertainty about the viability of the program in the long run thus discouraging investment in production of GSP eligible products.

This paper takes advantage of US Congress’ failure to renew the GSP and its unexpected

expiration in 2011 to quantify the effect of GSP expiration on exports from developing countries to the US. The expiration resulted in revocation of tariff exemptions on exports of about 3,500 products – at the Harmonized System (HS) 8-digit level – from about 130 developing countries. Tariffs increased uniformly across all developing countries eligible for the GSP, with the least developed countries becoming subject to tariff increases on additional 1,400 products.¹ This was followed by a reduction in exports claiming duty-free treatment under GSP from \$22.5 billion in 2010 to \$18.5 billion in 2011.

Because GSP benefits apply to certain countries and certain products, I am able to estimate the impact of revocation of tariff exemptions using triple difference-in-differences (product, country, expiration). As the rhetorical quote above from The Washington Post suggests we should not observe much impact on exports due to GSP expiration because the duties are ultimately refunded (DePillis, 2013). The findings of this paper, however, suggest otherwise; the expiration of GSP in 2011 had a considerable effect on the level of exports and propensity to export to the US. Exports dropped by about 3 percent in 2011 compared to the average level of exports in 2010 and 2012 and by 4.9 percent relative to the pre-expiration level of exports. The effect of expiration appears to be persistent, with the exports in 2012 still 4.25 percent lower relative to the pre-expiration level. The probability of a GSP eligible country exporting a GSP eligible product to the US decreased by 0.34 percentage points. Exports of textiles and apparel products and the probability of exporting these products declined by as much as 9 percent and 1.25 percentage points, respectively.

The impact of GSP expiration was the largest in product categories facing higher tariffs; exports of products facing 15 percent or higher tariff rates dropped by about 11 percent. Similarly, GSP exports with higher pre-expiration utilization rates experienced a larger drop; exports that fully claimed duty-free treatment prior to expiration dropped by 77.5 percent. Furthermore, it appears that the magnitude of the effect of the 2011 expiration

¹43 least developed countries qualified for these additional benefits in 2010.

is comparable to that of the 1995-96 and 2013-15 expiration episodes, the longest periods of expiration in the history of US GSP, but not the 2001-02 expiration which coincided with 9/11. These findings emphasize the importance of uninterrupted preferential market access in maintaining and stimulating exports from developing countries, and are relevant to the recurring policy debate on the renewal of GSP which is expected to expire again on December 31, 2020.

The remainder of this paper is organized as follows. Section 2 provides institutional background on the US GSP and discusses the relevant literature. The empirical specification is introduced in Section 3 and the data in Section 4. Results are reported in Section 5, and concluding remarks are provided in Section 6.

2 Institutional Background and Related Literature

The GSP program was first enacted in January 1975, reauthorized in 1984, and has been renewed twelve times since, nine times retroactively from the expiration date to the date of enactment (Appendix Table A1; Jones, 2017). The 2006 renewal (until December 2008) was the first time since 1993 that the program had not been allowed to lapse prior to its renewal. And such renewal was implemented two more times in 2008 and 2009. However, in 2010 Congress failed to renew the GSP and, it lapsed as of January 1, 2011 until November 5, 2011 when it was renewed again retroactively. It is worth noting that when the GSP is renewed retroactively to the date of its expiration, the duties paid are ultimately refunded, even through there is no statutory requirement to do so. This became important in the renewal debate during 2013-15 expiration when legislators expressed reluctance to forgo the collected duties amidst the discussions of greater austerity.

Past episodes of GSP expiration, nine in total, ranged from 36 days to two years. Four episodes lasted over 300 days – 1995-96, 2001-02, 2011 and 2013-15. This paper focuses on the expiration in 2011 which lasted 10 months, similar in duration to the expiration

in 2001-2002. The choice of the 2011 expiration has several reasons. First, all the other episodes of expiration begin and end mid-year, not an ideal setting for analyzing the impact on annual exports. Second, the 2011 expiration was unexpected and preceded by more than eight years of uninterrupted preferential access. Yet, at the end of 2010 Senator Jeff Sessions (R-AL) blocked the legislation extending the GSP program in Congress.² In contrast, the 1995-96, 2001-02 and 2013-15 expirations were preceded by (often brief) lapses of GSP which makes it challenging to capture the full effect of expiration. Furthermore, the 2001 expiration coincided with September 11, 2001 attacks on the World Trade Center when exports from all countries to the US collapsed due to increased security at the border. Thus, it might be difficult to disentangle the effect of 9/11 from the effect of GSP expiration.³

The impact of expiration may vary across different countries and products due to other features of the GSP and US trade policy in general. For example, the well-documented underutilization of US GSP (Hakobyan, 2015) suggests that country-product pairs with higher pre-expiration utilization rates are likely to be more sensitive to the suspension of preferences. Also, country-product pairs exceeding Competitive Needs Limits (Hakobyan, 2017) or countries graduating from the program become ineligible for GSP benefits and may not be affected by the expiration. This calls for a careful examination of eligibility criteria in order to identify *de facto* ineligible country-product pairs and exclude them from the analysis. Finally, some GSP eligible countries simultaneously qualify for duty-free treatment under other trade arrangements such as African Growth and Opportunity Act (AGOA), Caribbean Basin Economic Recovery Act (CBERA) and Andean Trade Preference Act (ATPA) and are unlikely to bear the brunt of GSP expiration.

The existing literature typically examines the effect of extending preferential access by

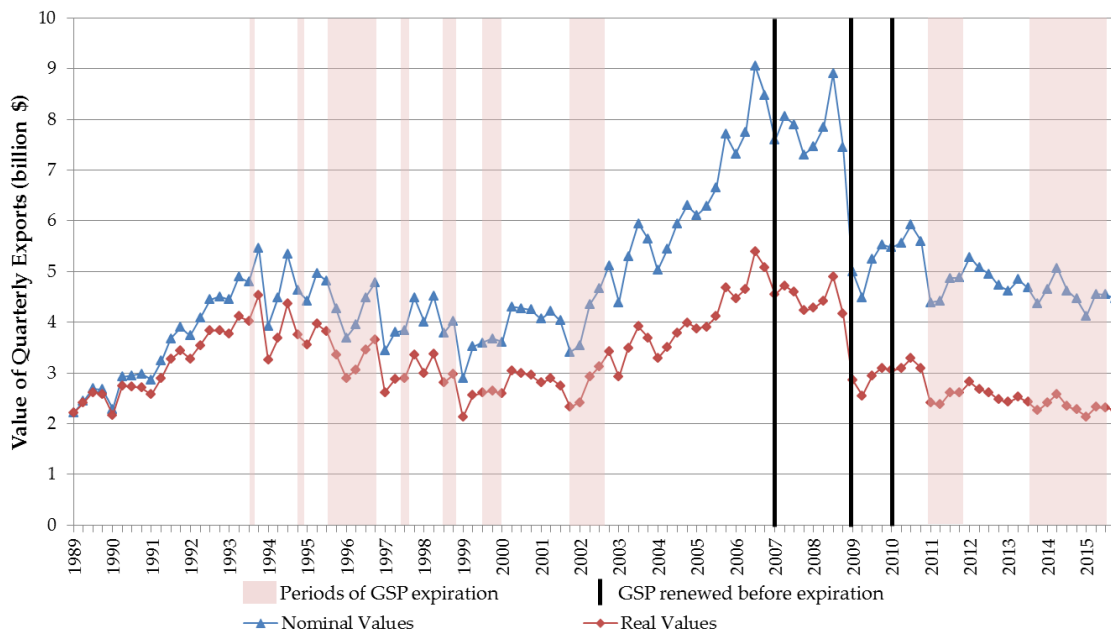
²At the request of a domestic manufacturer of sleeping bags who competed with Bangladeshi exports of similar products, Senator Jeff Sessions (R-AL) vetoed the legislation to renew GSP in Congress (The New York Times, 2011; Blanchard and Hakobyan, 2014).

³Although the analysis focuses on the expiration in 2011, the expanded sample period covering all nine episodes of expiration from 1990 to 2017 is used as a robustness check.

studying the trade patterns following the removal of tariffs. The clear focus is to gauge how these preferences stimulate exports of beneficiary countries. Most studies focus on aggregate trade flows and attempt to identify the trade effects of preferential access from cross-sectional variation with often mixed results (Ornelas, 2016). The focus on aggregate trade flows raises concerns related to whether the estimated effects reflect the causal relationship between preferences and trade flows. There are surprisingly very few studies that concentrate on disaggregated trade flows and explore *within* product variation. Frazer and Van Biesebroeck (2010) who were the first to exploit the time-varying status of preferential schemes to evaluate their impact on disaggregated US trade flows. In particular, using data from 1988 to 2006, they find that AGOA led to an increase of almost 13 percent in export volumes of the affected country-product pairs, with an even larger effect for apparel. Thelle et al (2015) conduct similar analysis focusing on the non-reciprocal arrangements of the EU, finding that the GSP preferences boost the exports of covered products by almost 5 percent on average. There also exists a relatively scant literature examining the effect of revocation of preferential treatment of specific country-product pairs under the US GSP. Hakobyan (2017) and DeVault (1996) explore a feature of GSP that caps the benefits of most successful exporters – Competitive Needs Limits – and find that exports of affected country-product pairs decline in the year benefits are suspended and continue to drop in subsequent years. They also find that other non-GSP countries rather than other GSP countries fill the void in exports.

A growing literature on trade agreements and uncertainty provides evidence of the positive effect of uncertainty reducing trade agreements on trade flows and firms' investment decisions (Handley and Limão, 2012; Handley, 2012). Handley and Limão (2013) show that Chinese export growth in 2000-2005 was higher in those industries that faced greater trade policy uncertainty. In the context of GSP, uncertainty may have multiple origins. The GSP expires periodically and there is an uncertainty whether it will be renewed prior to its expiration. If it is not renewed, then an additional uncertainty arises from the dura-

Figure 1: Nominal and Real Quarterly Exports under GSP, 1989-2015 (not seasonally adjusted)



Notes: Nominal values have been deflated using the Consumer Price Index (CPI).

tion of the lapse. Finally, there is no statutory requirement that the Congress renew GSP retroactively, although this has always been the practice in the past.⁴

The contribution of this paper to the existing literature is three-fold. First, it focuses on understanding the effect of *suspension* of preferential access across *all* GSP eligible countries and products, as opposed to *granting* of preferential access or revoking it for a *subset* of countries and products. This is particularly relevant in the current trade climate where countries choose to erect new trade barriers. Second, it enhances our understanding of the transitory increases in tariffs, eventually followed by a retroactive compensation of duties paid. Finally, this paper also provides another lens through which to think about trade policy uncertainty, even though it does not offer direct estimates of the uncertainty.

To my knowledge, this is the first paper to empirically examine the effect of the US GSP expiration on trade flows from developing countries. An annual report on GSP (2013) by

⁴During the 2013-15 expiration, a USTR document explicitly stated that “It is not known at this point whether or when Congress will reauthorize the GSP program, but many Members of Congress have voiced support for re-authorization of GSP” and “it is not known whether any future action on GSP will be made retroactive” (USTR, 2014).

The Trade Partnership, a Washington-based consulting firm, is the only source pointing to the possible link between GSP expiration (or the length of expiration) and growth of exports under GSP program. Figure 1 illustrates the quarterly GSP exports to the US between 1989 and 2015 (not seasonally adjusted), with shaded areas representing periods of GSP expiration and solid lines indicating dates when GSP was renewed prior to its expiration. Looking at Figure 1, one may argue that GSP expiration and particularly the frequency of its expiration hamper the growth of exports under GSP program, at least at the onset of the expiration.

3 Estimation strategy and data

3.1 Empirical Specification

The revocation of tariff exemptions may force exporters to reduce the volume of exports, as well as prompt them to stop exporting a range of products to the US. To gauge the impact of GSP expiration on the volume of exports (intensive margin) and the propensity to export from developing countries to the US (extensive margin), I examine the pattern of dutiable exports from all countries to the US, regardless of their GSP eligibility. More specifically, following Frazer and Van Biesebroeck (2010), I employ an unrestrictive triple-difference regression specification to measure the magnitude of the GSP expiration effect:⁵

$$\ln Exports_{cpt} = \beta GSPcountry_c \times GSPproduct_p \times Expired_t + \gamma_{cp} + \delta_{ct} + \theta_{pt} + \epsilon_{cpt}. \quad (1)$$

$\ln Exports_{cpt}$, the dependent variable, refers to log exports of product p from country c to the US in year t , or is a dummy variable that takes the value of 1 if the country-product-year observation has positive exports to the US and 0 otherwise.⁶ The variable $GSPcountry_c$

⁵For a thorough discussion of assumptions in more restrictive and unrestrictive triple-difference specifications, see Frazer and Van Biesebroeck (2010).

⁶As zero export observations are included in the regression, the estimated effect of the revocation of tariff exemptions on the value of exports includes both the response at the intensive margin - decreased exports - and at the extensive margin - stopped exports. I am able to isolate the response at the extensive margin by replacing the dependent variable with positive exports dummy.

is a time-invariant dummy that takes the value of 1 if a country is GSP eligible and 0 otherwise.⁷ Likewise, the variable $GSP_{product_p}$ is a time-invariant dummy that takes the value of 1 for products eligible for duty-free treatment under GSP and 0 otherwise. The variable $Expired_t$ is a dummy that switches from 0 to 1 for all countries and products in 2011 when GSP was expired for the 10 months of the year.⁸ The empirical specification allows for a full set of country-product γ_{cp} , country-year δ_{ct} and product-year θ_{pt} fixed effects. These interactive fixed effects allow for heterogeneity in the level of exports of any product from any country in a year when GSP is in effect, the overall exports of any country to the US in any year, and the overall exports of any product to the US in any year. The parameter of interest is the estimated coefficient on the triple interaction term, β , which measures the impact of GSP expiration relative to a country-product specific level of exports in the years when GSP was in effect. Robust standard errors are clustered by country and product to allow for correlation of error terms across products within a country, and across countries within a product.

The triple difference-in-differences is superior to the standard difference-in-differences estimation, as the latter might inaccurately attribute country- or product-level trends in exports to the impact of GSP expiration. At the country level, consider a country that lost GSP tariff exemptions at the time when the economic conditions in the country were deteriorating, resulting in an overall decrease in exports to the US. The country-by-country difference-in-differences estimator would mistakenly attribute this negative effect to GSP

⁷For the purposes of this paper, GSP eligible countries are defined as those that qualify for duty-free treatment only under the GSP program. Countries that are simultaneously eligible for other trade preference programs (AGOA, CBERA, ATPA) and able to claim duty-free treatment under these alternative programs, are not considered GSP eligible. In the robustness checks, we ignore this distinction and treat all GSP eligible countries equal. An additional concern is the frequent graduations/suspensions and additions of countries. Over the sample period six countries (Cape Verde, Croatia, Equatorial Guinea, Argentina, Panama, Colombia) were removed from the GSP. Three were concurrently eligible for other preference programs, and hence considered GSP ineligible for the purpose of this paper. Argentina was removed on May 28, 2012 due to arbitral disputes with US companies, so it was eligible for part of the year and is assumed eligible in all years of the sample period. For Croatia and Equatorial Guinea that graduated from the GSP on January 1, 2011, the country eligibility dummy takes the value of 1 only in 2010. South Sudan was designated as a GSP eligible country on April 18, 2012 and the country eligibility dummy is set to one only in 2012.

⁸This specification already requires a large number of fixed effects, and working with monthly or quarterly data would introduce mostly zero-valued export observations.

expiration. On the other hand, at the product level, consider products for which the GSP tariff exemptions were revoked and at the same time the US demand was dropping. In this case, a product-by-product difference-in-differences estimator would again erroneously attribute the negative effect to GSP expiration. The use of triple-difference estimator addresses these concerns.

There may be some limitations to my analysis worth noting. First, the triple-difference specification may be biased if exports of non-GSP countries replace those from GSP eligible countries. Hakobyan (2017) provides evidence for such spillover effect when exports of a narrowly defined products excluded from certain GSP eligible countries are replaced by those from other GSP eligible countries and non-GSP countries. When such spillover effects are present, the comparison group of non-GSP countries may be inappropriate in identifying the GSP expiration effect, and a product-by-product difference-in-differences estimator might be more suitable.⁹ Second, in all previous instances when the Congress failed to renew GSP prior to its expiration, the GSP was always renewed retroactively, and the paid duties were refunded. The payment of such refunds has become increasingly easy with the widespread use of electronic payment transactions. For this reason, it is not evident that one would find negative effects from GSP expiration, except for the fact that expirations lasted only few months in the past and the wind of political change pointing to greater austerity in 2011. Third, the GSP expiration lasted for the first 10 months of 2011 and GSP benefits resumed for the last two months of 2011, therefore the analysis based on annual data might underestimate the impact of expiration.

⁹As reported in Table 2 below, the results from product-by-product difference-in-differences estimation are almost identical to those from the triple-difference estimation. Hence, there is little evidence of declining exports from GSP eligible countries being replaced by exports from non-GSP countries. This could be explained by the relatively short span of GSP expiration, compared to the exclusions documented by Hakobyan (2017) that span two years and more.

3.2 Data

I create a three-way balanced panel of all countries and all dutiable products at the HS 6-digit level for three years of my sample period.¹⁰ The dependent variable in the intensive margin regressions is the log exports of a particular product from all US trading partners to the US between 2010 and 2012, obtained from the US International Trade Commission (USITC).¹¹ To allow for zero-valued exports, I follow Frazer and Van Biesebroeck (2010) and add one dollar to all export values before taking logarithms.¹² In the extensive margin regressions the dependent variable is a binary variable that takes the value of 1 if exports are positive and 0 otherwise.

The GSP country and product eligibility data are obtained from the USITC and from various notices and presidential proclamations published in *Federal Register*. GSP product eligibility is defined at the HS 8-digit level of aggregation, the same level at which the tariff rates are set. To allow for the estimation given the large number of interactive fixed effects and the number of observations with zero-valued exports, I aggregate GSP product eligibility to the HS 6-digit level by weighing each 8-digit subcategory by its share in US imports in 2010.¹³ Thus, the $GSP_{product,p}$ variable represents the fraction of eight-digit products (by value) that are eligible for duty-free treatment under GSP. Tariff rates obtained from the USITC are measured as either the ad valorem tariff or the ad valorem equivalent for specific and combined tariffs, and are aggregated to the HS 6-digit level using the same weights as for the GSP product eligibility described above.

¹⁰26 (primarily island) countries for which less than 5 product categories were observed in any of the three years were dropped from the sample. Of these, 15 were GSP eligible.

¹¹Throughout the paper I use US imports from all its trading partners obtained from the USITC Trade DataWeb which is a more reliable and accurate source of data for exports from developing countries to the US.

¹²To deal with the estimation challenges posed by the logarithmic transformation and zero trade flows, I also estimate a Poisson Pseudo-maximum Likelihood (PPML) which yields GSP expiration effects of similar magnitude. This is discussed in Section 4.2.

¹³To check the robustness of results, I re-estimate the benchmark regressions at the HS 8-digit level. The results reported in Columns 2 and 4 of the Table 5 are not qualitatively different from those at the HS 6-digit level. Hence, throughout the paper I report the results using the sample at the HS 6-digit level. The results at the HS 8-digit level are available upon request.

Table 1: Summary Statistics, 2010

Panel A: Export Values and Number of Products by Country				
	Log exports (mean)	Log exports (st dev)	N of products (mean)	N of products (max)
GSP countries (66)				
All dutiable products	0.89	(3.14)	3,179	
All dutiable products with exports>0	11.17	(2.97)	296	2,170
All GSP-eligible products with exports>0	11.43	(2.76)	174	1,468
Non-GSP countries (139)				
All dutiable products	1.73	(4.30)	3,179	
All dutiable products with exports>0	11.59	(3.07)	597	2,774
All GSP-eligible products with exports>0	12.10	(2.94)	444	1,964
Panel B: GSP Products by Sector: Limited to GSP Eligible Countries				
	All	Exports>0 (mean)	Exports>0 (max)	Avg. Tariff (exports>0)
All	2,299	174	1,468	4.3%
Agricultural	376	40	149	4.4%
Fuel and Minerals	103	15	53	3.0%
Textiles and Clothing	17	6	12	4.3%
Manufacturing (excluding textiles/clothing)	1,803	156	1,254	4.7%

Notes: GSP countries include only those that are GSP eligible and do not qualify for other trade preference programs such as AGOA, CBERA and ATPA. GSP products refer to those at the HS 6-digit level for which the underlying all HS 8-digit products are GSP eligible.

Table 1 provides the summary statistics for 2010, the year prior to the GSP expiration. GSP countries export fewer products and smaller amounts on average than an average non-GSP country. From the universe of 3,179 dutiable products, the average GSP country has positive exports in 296, and 174 products enter the US under the GSP (out of potential 2,299 GSP products). The comparable figures for an average non-GSP country are 597 and 444 products, respectively. The values of log exports from an average GSP and non-GSP country with positive exports are 11.17 and 11.59, respectively. Manufacturing products dominate the export basket of an average GSP country; about 90 percent of exported GSP products are manufactures (156 out of 174). The most successful exporting country (India) exports about two-thirds of all GSP eligible products. Average trade-weighted tariff

rates for all GSP eligible product categories with positive exports are in the range of 4.3-4.7%, except for fuel and mineral products.

4 Results

4.1 Basic Results

Estimates of equation (1) are reported in Table 2. Column 1 reports the results from a specification with a full set of country-product, country-year and product-year fixed effects estimated using the three-way balanced panel of all countries for all dutiable products between 2010 and 2012. The estimated coefficient on the triple interaction term suggests that the GSP expiration is associated with a statistically significant (at the 1 percent level) average drop of 2.88 percent in exports to the US, relative to the average level of exports in 2010 and 2012 when the GSP was in effect.¹⁴

For comparison, I also report standard difference-in-differences estimates in Columns 2 and 3. The standard difference-in-differences can be implemented by restricting the sample either to all dutiable products exported from GSP eligible countries to the US (product-by-product difference-in-differences) or to GSP eligible products exported from all countries to the US (country-by-country difference-in-differences). Column 2 reports the results from restricting the sample to developing countries that can claim duty-free treatment on their exports only under GSP.¹⁵ The treatment group is GSP eligible products, with GSP ineligible products representing the control group. The GSP expiration effect becomes -2.81 percent and continues to be statistically significant at the 1 percent level. Given how close this estimate is to the one from triple-difference estimation, I conclude that there is little evidence of the “spillover effect” when exports of non-GSP countries replace those of GSP

¹⁴As discussed below, the expiration effect is larger when measured against the pre-expiration level of exports, suggesting that the 2011 expiration might have also depressed exports in 2012.

¹⁵This excludes countries eligible for other US trade preference programs, such as AGOA, ATPA and CBERA.

Table 2: Benchmark Results for the GSP Expiration Effect (three-way balanced panel)

Dependent Variable	<i>lnExports</i>	<i>lnExports</i>	<i>lnExports</i>	Export Dummy
Sample	Full	Only GSP countries	Only GSP products	Full
Method	Triple Diff	Diff-in-Diff	Diff-in-Diff	Triple Diff
	(1)	(2)	(3)	(4)
Marginal effect	-2.88%	-2.81%	-2.48%	
Expired \times Country \times Product	-0.0292*** (0.011)	-0.0285*** (0.0096)	-0.025*** (0.0077)	-0.0029** (0.001)
Fixed Effects	Country-product, country-year, product-year	Country-product, country-year	Country-product, product-year	Country-product, country-year, product-year
Observations	1,955,085	607,189	1,023,565	1,955,085
Number of fixed effects	661,847	369,112	346,318	661,847

Notes: Columns 1 and 4 include all three sets of interactive fixed effects: country-product, country-year and product-year. Column 2 includes country-product and country-year fixed effects, and Column 3 includes country-product and product-year fixed effects. The marginal effects throughout this paper are calculated as $exp(\beta) - 1$ if the dependent variable is *lnExports*. Robust standard errors in parentheses are clustered by country and product. ***, ** and * indicate significance at the 1%, 5% and 10% level, respectively.

eligible countries, thus the choice of non-GSP countries as a control group is valid.¹⁶

In Column 3, the sample is restricted to GSP eligible products exported from all countries to the US.¹⁷ This specification identifies the GSP expiration effect from the relative drop in exports from eligible countries (treatment group) versus ineligible countries (control group). The GSP expiration effect is slightly smaller at -2.48 percent, although still statistically significant at the 1 percent level. In both standard difference-in-differences specifications the GSP expiration effect is only slightly underestimated, hence the rest of the paper proceeds with the triple-difference specification employing the full sample of countries and products (unless otherwise noted).

Turning to the impact of GSP expiration on the extensive margin (Column 4 in Table 2), the probability that a GSP eligible country exports a GSP eligible product to the US

¹⁶For the sake of completeness, I also estimate a standard difference-in differences specification by restricting the sample to all dutiable products exported from GSP ineligible countries to the US. The point estimates are not statistically significantly different from zero.

¹⁷The sample excludes products reserved for least developed countries.

is decreased by 0.3 percentage points during the period of expiration. This may seem to be economically insignificant, however it is relatively sizable compared to the average probability of exporting which was 7.9 and 12.7 percent in 2010 for GSP eligible countries and all countries worldwide, respectively.

4.2 Robustness Checks

I conduct several robustness checks. In the first step, I test whether the robustness of the main results depends on the way the dependent variable is defined. Recall that in the baseline regressions the dependent variable was constructed by adding one dollar to all export values before taking the logarithms. The Poisson pseudo-maximum likelihood (PPML) estimator proposed by Santos Silva and Tenreyro (2006) is considered more appropriate for dealing with the estimation challenges posed by the logarithmic transformation and zero trade flows and is being employed increasingly more often. The results from PPML are reported in Column 2 of Table 3, with the benchmark results from Table 2 reproduced in Column 1. The PPML estimate confirms that the GSP expiration is associated with a statistically significant drop in exports from GSP eligible countries to the US. The GSP expiration effect is slightly larger at -5 percent compared to the benchmark estimate.¹⁸

Next, I examine the robustness of the results against alternatively defined control and treatment groups. I first restrict the sample to non-OECD countries to make the control group (non-GSP countries) more comparable to the treatment group (GSP countries). The results are reported in Column 3 of Table 3. The estimated impact of GSP expiration is only slightly larger at -2.94 percent compared to the benchmark estimate of -2.88 percent.

I then redefine the treatment group to also include other GSP eligible countries that qualify for an alternative trade preference program in addition to GSP such as AGOA, CBERA and ATPA. These countries were assumed GSP ineligible throughout the paper

¹⁸Despite the PPML being the preferred specification in the presence of zero trade flows, I chose not to adopt it as my main specification as it fails to converge when the number of fixed effects increases (e.g. when utilizing the sample at the HS 8-digit level or expanding the sample period to 28 years).

Table 3: Robustness Checks: PPML; Control and Treatment Groups; Post-Renewal and Placebo

	Benchmark	PPML	Non-OECD control group	All GSP eligible countries	Post- renewal effect	Placebo regression
	(1)	(2)	(3)	(4)	(5)	(6)
Marginal effect	-2.88%		-2.94%	-2.88%	-4.88%	1.11%
Expired × Country × Product	-0.029*** (0.011)	-0.050** (0.022)	-0.030*** (0.010)	-0.029*** (0.011)	-0.050*** (0.013)	0.011 (0.011)
Marginal effect Post × Country × Product					-4.25% -0.043*** (0.014)	
Observations	1,955,085	328,615	1,754,808	1,955,085	1,955,085	1,793,760

Notes: Column 1 replicates the benchmark estimates from Table 2. Column 2 reports the PPML estimates. Column 3 excludes OECD countries. Column 4 uses the statutory definition of a country's GSP eligibility regardless of whether it qualifies for other trade preference programs or not. Column 5 includes an additional interaction term with post-renewal dummy. Column 6 reports the estimates from a placebo regression using data for 2006-2008. All regressions include country-product, country-year and product-year interactive fixed effects. Robust standard errors in parentheses are clustered by country and product. ***, ** and * indicate significance at the 1%, 5% and 10% level, respectively.

because their preferential market access terms remained effectively the same after the expiration of GSP. I redefine the GSP country eligibility dummy to take the value of 1 for all GSP eligible countries regardless of their eligibility in other preference programs. The results reported in Column 4 of Table 3 show no change in the impact of expiration suggesting that this group of countries might have also experienced a comparable drop in exports.

An important question is whether the estimated expiration effect is transitory or permanent, i.e. whether the exports fully recover after the renewal or remain depressed compared to the pre-expiration level of exports. I interact a post-renewal dummy that takes the value of 1 in 2012 and zero otherwise with GSP country and product eligibility and include it as an additional control to capture the rebound of exports, if any, after the GSP is renewed. The results reported in Column 5 of Table 3 show that the exports in 2011, the year of expiration, and in 2012, when GSP was back in effect, are on average 4.9 and 4.25 percent lower, respectively, compared to pre-expiration level of exports, suggesting

that the expiration had a long lasting effect on exports stretching into the post-renewal period.¹⁹

As discussed earlier in the paper, the episodes of GSP expiration were commonplace until 2002 when it was renewed for four years until December 31, 2006. By the end of 2006, there may have been expectations that the Congress would fail to renew the GSP on time letting it expire, analogous to what happened at the end of 2010. This provides a good setting to run a placebo regression to examine whether the prospect of renewal at the end of 2006 had the same effect on exports to the US as the actual expiration at the end of 2010. Using data from 2006 to 2008, I re-estimate equation (1) assuming the year of expiration is 2007 which would have been the case if the Congress were not to renew GSP at the end of 2006. The results reported in Column 6 of Table 3 indicate that the possible GSP expiration at the end of 2006 did not have any noticeable impact on the exports from developing countries to the US.

The focus on the 2011 expiration in this paper was primarily dictated by the quest to estimate the full impact of expiration, void of other conflicting circumstances. The 2011 expiration provided the ideal setting: the GSP was in effect for the preceding eight years and exporters expected its renewal by the end of 2010, and the expiration lasted long enough to make a dent in the annual volume of exports. Nevertheless, it is important to understand how the effect of the 2011 expiration was different from that of other episodes, particularly those that were similar in duration to the 2011 episode. Therefore, I extend the sample period to include all nine episodes of expiration between 1990 and 2017. However, this exercise raises a couple of concerns. First, given the frequent (every 5 years) modifications in product codes, constructing consistent time series for products is challenging, so is the choice of a base year for constructing import weights for aggregating data to HS 6-digit level. I use 1990 as a base year to compute import weights, but reset the

¹⁹The expiration effect is larger here because it is compared to the pre-expiration export levels, whereas in the benchmark specification, the expiration effect is estimated against the average level of exports in 2010 and 2012 when the GSP was in effect.

Table 4: Expanded Sample Period, 1990-2017

Dependent Variable	Single expiration dummy		Separate episode dummies		
	<i>lnExports</i>	Export Dummy	<i>lnExports</i> Point estimate	<i>lnExports</i> Marginal Effect	Export Dummy
	(1)	(2)	(3)	(4)	(5)
Marginal effect	-7.34%				
Expired × Country × Product	-0.076*** (0.024)	-0.0093*** (0.0028)			
Expired × Country × Product					
× 1995-96 episode			-0.089** (0.041)	-8.6%	-0.012** (0.006)
× 2001-02 episode			-0.023 (0.035)	-2.3%	-0.0005 (0.004)
× 2011 episode			-0.078*** (0.027)	-7.5%	-0.0096*** (0.003)
× 2013-15 episode			-0.117*** (0.038)	-11.0%	-0.015*** (0.004)
Observations	20,422,191	20,422,191	20,422,191		20,422,191

Notes: Column 1 replicates the benchmark estimates from Table 2. Column 2 reports the estimates from the expanded sample spanning from 1990 to 2017. Column 3 reports the impact of expiration separately for four longest episodes of expiration in the history of the GSP. Robust standard errors in parentheses are clustered by country and product. ***, ** and * indicate significance at the 1%, 5% and 10% level, respectively.

base year, and hence the weights, for any HS 6-digit product category that sees changes to its 8-digit product codes. Second, for longer time series, imports need to be deflated, and I use the import price index from Bureau of Labor Statistics (BLS) to deflate import values. With these caveats in mind, I first estimate equation (1) using data from 1990 to 2017 with a slight change in definition of the variable *Expired* as a fraction of the year the program has been expired to accommodate the expirations that lasted few months within a year.

The results in Column 2 of Table 4 indicate that over 28-year period, the average impact of GSP expiration is estimated at -7.34 percent. In addition to estimating an average effect across all expiration episodes, the expanded sample also allows the “treatment effect” to vary across different episodes by further interacting the triple interaction term with an

Table 5: GSP Expiration Effect at the HS 6- and 8-digit levels

Dependent Variable	<i>lnExports</i>	<i>lnExports</i>	Export Dummy	Export Dummy
Level of Aggregation	HS 6-digit	HS 8-digit	HS 6-digit	HS 8-digit
Marginal effect	-2.88%	-2.22%	-0.29%	-0.18%
Expired \times Country \times Product	-0.029*** (0.011)	-0.022*** (0.007)	-0.003** (0.001)	-0.002** (0.0007)
Observations	1,955,085	3,983,355	1,955,085	3,983,355

Notes: Columns 1 and 3 use the data aggregated to the HS 6-digit level and replicate the results from Table 2. Columns 2 and 4 use the data defined at the HS 8-digit level. All regressions include country-product, country-year and product-year interactive fixed effects. Robust standard errors in parentheses are clustered by country and product. ***, ** and * indicate significance at the 1%, 5% and 10% level, respectively.

episode dummy. As reported in Column 4 of Table 4, the expiration appears to have a negative impact on exports from developing countries when it lasts relatively long. In particular, the estimated impact of 1995-96, 2011 and 2013-15 expiration episodes is -8.6 , -7.5 and -11 percent, respectively.²⁰ The point estimate for 2001-02 expiration which coincided with 9/11 is not significantly different from zero.²¹ Similarly, the probability that a GSP eligible country exports a GSP eligible product to the US is decreased by 0.9 percentage points on average during the period of expiration.

The next set of tests examines potential data aggregation concerns. Since the GSP eligibility is defined at the HS 8-digit level (the same level of aggregation at which tariff rates are set), the aggregation of data up to the HS 6-digit level may introduce a bias. To check for this possibility, I re-estimate the benchmark results in Table 2 at the HS 8-digit level. The results in Table 5 indicate that the drop in exports is only slightly smaller at the HS 8-digit level; GSP expiration is associated with 2.2 percent drop in exports, suggesting that the potential bias due to data aggregation is minimal and the rest of the analysis is carried out at the HS 6-digit level.

Finally, it is important to recognize that the estimates in Table 2 provide the lower

²⁰Note that the estimated impact of the 2011 expiration is not directly comparable to the baseline results due to different assumptions regarding the base year for aggregation purposes, as well as the definition of *Expired* variable.

²¹The point estimates for other expiration episodes (not reported here but available upon request) are also not significantly different from zero.

Table 6: Benchmark Results for the GSP Expiration Effect (two-way balanced panel)

Dependent Variable	<i>lnExports</i>	<i>lnExports</i>	<i>lnExports</i>
Sample	Full	Only GSP countries	Only GSP products
Method	Triple Diff	Diff-in-Diff	Diff-in-Diff
	(1)	(2)	(3)
Marginal effect	-18.9%	-18.2%	-12.3%
Expired \times Country \times Product	-0.209*** (0.079)	-0.201** (0.079)	-0.131** (0.059)
Fixed Effects	Country-product, country-year, product-year	Country-product, country-year	Country-product, product-year
Observations	331,017	69,655	169,448
Number of fixed effects	120,371	23,536	61,443

Notes: Column 1 includes all three sets of interactive fixed effects: country-product, country-year and product-year. Column 2 includes country-product and country-year fixed effects, and Column 3 includes country-product and product-year fixed effects. Robust standard errors in parentheses are clustered by country and product. ***, ** and * indicate significance at the 1%, 5% and 10% level, respectively.

bound of the GSP expiration effect because they employ a three-way balanced panel across all US trading partners, products and years to represent all potential trade flows. Consider a country like Afghanistan that only exports 50 product categories to the US, with its exports of the remaining product categories (over 3,000) recorded as zeros. Thus, the estimates in Table 2 provide the effect of GSP expiration on all *potential* trade flows. One could argue, however, that to measure the true impact of GSP expiration the sample needs to be limited to products that Afghanistan is already producing and exporting. To account for this and to estimate the impact of GSP expiration on *actual* trade flows, I construct a two-way balanced panel by limiting the sample to products for which exports from a given country are positive in any of the three years of the sample period. This reduces the number of observations by about 80 percent.

As reported in Column 1 of Table 6, the effect of GSP expiration on observed export flows from developing countries is considerably larger (six times larger); the GSP expiration is associated with a statistically significant 19 percent drop in exports. Similar to the pattern observed in Table 2, the standard difference-in-differences estimates underes-

timate the impact of GSP expiration, more so when the sample is restricted to GSP eligible products. These estimates provide the upper bound of the GSP expiration effect and are more consistent with the estimation strategy used by Handley and Limão (2013). The rest of the paper reports lower bound estimates of GSP expiration effect employing a three-way balanced panel, with the upper bound estimates from a two-way balanced panel provided in the Appendix Tables A2-A5.

4.3 Heterogeneous Effects of GSP Expiration

The results in Table 2 measure the average effect across all GSP eligible countries. However, the effect might be different for least developed beneficiary countries (LDBCs) and developing beneficiary countries (DBC).²² In addition to standard GSP eligible product categories, LDBCs qualify for duty-free treatment on additional product groups. Allowing for heterogeneous expiration effect for these two groups of countries simply requires replacing the $GSP_{country_c}$ and $GSP_{product_p}$ terms in equation (1) with respective terms representing LDBC and DBC countries and the set of eligible products for each group of countries.

Table 7 reports the results of triple-difference specification allowing for heterogeneous country effects. The relative magnitude and significance of the effect for DBCs is similar to those reported in Table 2; the GSP expiration resulted in a statistically significant 3.3 percent drop in exports and 0.34 percentage points drop in the probability of exporting from GSP eligible developing countries. However, the effect on both exports and probability of exporting is insignificant for LDBCs. The imprecisely estimated coefficient on LDBCs could be explained by the small number of least developed countries exporting negligible number of products to the US in the sample. Most LDBCs, as defined for the purpose of GSP, qualify for AGOA which remained intact during the period of GSP expiration, and

²²The designation of a country as DBC or LDBC for the GSP purposes is not directly linked (at least statutorily) to its income level, and is decided by the US President.

Table 7: The GSP Expiration Effect for LDBC and DBCs

Dependent Variable	<i>lnExports</i>		Export Dummy
	Point Estimate	Marginal Effect	
	(1)	(2)	(3)
Expired × DBC × DBC Product	-0.034*** (0.012)	-3.31%	-0.0034*** (0.001)
Expired × LDBC × LDBC Product	-0.0099 (0.019)	-0.99%	-0.0006 (0.0024)
Observations	1,955,085		1,955,085

Notes: Regressions include country-product, country-year and product-year interactive fixed effects. Robust standard errors in parentheses are clustered by country and product. ***, ** and * indicate significance at the 1%, 5% and 10% level, respectively.

hence, could have claimed AGOA preferences instead of GSP.²³

One might also wonder whether these effects are driven by outliers. I evaluate the impact of expiration at a more disaggregated level by estimating the country-specific triple interaction effects separately for each country. The average country-specific effect is estimated at -0.0293 which aligns closely with the main results in Table 2. Appendix Figure A1 shows the kernel density of the estimated effects. The dispersion of the estimated effects across countries is substantial, with coefficients ranging from -24.8 to 11.6 percent. Turkey appears to be the most affected country with an estimated impact of about 25 percent. Replicating the baseline specification excluding Turkey does not materially affect the main results; the GSP expiration continues to be associated with 2.5 percent drop in exports from developing countries.

Next, I allow for heterogeneity in responses across different subcategories of products: agricultural, fuel and minerals, textiles and clothing, and manufacturing (excluding textiles and clothing). To allow for heterogeneous effects for these subcategories, the triple interaction term in equation (1) is further interacted with a dummy for each of the product subcategories.

As seen in Table 8, there are considerable differences in the effect of GSP expiration

²³Only 14 out of 42 LDBC (such as Afghanistan, Bangladesh and Nepal) were affected by the GSP expiration.

across different product subcategories. The fuel and minerals effect is insignificant, while the expiration effect is negative and significant for the remaining subcategories. The GSP expiration resulted in 2.63 percent drop in exports of manufacturing products (other than textiles and clothing), 4.67 percent in agricultural products, and 9.03 percent in textiles and clothing.²⁴ Additionally, the extensive margin of trade in these product subcategories is also adversely affected due to GSP expiration; the probability of exporting textiles and apparel products decreases by 1.25 percentage points relative to the average probability of 2.6 percent for GSP countries (and 3.4 percent for all countries) exporting these products prior to expiration. Thus, the probability of exporting textiles and clothing is cut in half for GSP countries. A similar pattern is observed for agricultural products; the probability of exporting declines by 0.4 percentage points relative to the baseline of 0.8 percent for GSP countries (and 1.2 percent for all countries) prior to GSP expiration. On the other hand, the decline in the probability of exporting manufacturing products is relatively smaller – 0.3 percentage points relative to the baseline of 4.3 percent for GSP countries.

Next, I examine the effect of GSP expiration on exports of products facing different levels of tariff rates prior to the expiration. The GSP expiration effect is likely increasing in the tariff rates. In other words, the higher the tariff rate imposed on a product, the greater the loss of duty savings and the greater the decline in exports of such a product. To estimate the impact of tariff increases of different magnitudes, I interact the triple interaction term in equation (1) with dummies for different tariff groups. The lowest tariff group dummy takes the value of 1 if the 2010 tariff rates were between 0% and 3% and 0 otherwise. The subsequent tariff groups use the following brackets: 3-6%, 6-10%, 10-15%, and higher than 15%.²⁵

²⁴The results for textiles and clothing need to be taken cautiously. A very small and unique set of textile and apparel products are eligible for the US GSP (78 out of 1,263 products at HS 8-digit level in 2010). These include artificial fur, certain types of gloves and mittens, belts, scarves, handkerchiefs, hats, headgear, and other articles of apparel and clothing accessories, as well as certified hand-loomed and folklore fabrics and products, paper yarn, certain types of twine, ropes and cables, hammocks, headbands, table linen, and wall banners.

²⁵The average and median MFN tariff rate in 2010 across all dutiable products was 6.1 and 4.5 percent, respectively. Appendix Figure A2 shows the distribution of MFN tariff rates in 2010.

Table 8: The GSP Expiration Effect for Different Product Categories

Dependent Variable	<i>lnExports</i>		Export Dummy
	Point Estimate	Marginal Effect	
	(1)	(2)	(3)
<hr/>			
Expired × Country × Product Interaction			
Agriculture	-0.048*** (0.015)	-4.67%	-0.0039** (0.002)
Fuels and Minerals	-0.007 (0.027)	-0.71%	-0.0006 (0.003)
Textiles and Clothing	-0.095* (0.051)	-9.03%	-0.0125* (0.007)
Manufacturing (excluding textiles/clothing)	-0.027** (0.011)	-2.63%	-0.0027** (0.001)
<hr/>			
Observations	1,955,085		1,955,085

Notes: Regressions include country-product, country-year and product-year interactive fixed effects. Robust standard errors in parentheses are clustered by country and product. ***, ** and * indicate significance at the 1%, 5% and 10% level, respectively.

The results reported in Table 9 confirm the nonlinear effect of tariff increases on exports. As expected, the GSP expiration effect is greatest for high tariff brackets; the revocation of tariff exemptions of more than 15% as a result of GSP expiration induces about 11 percent drop in exports (statistically significant at the 5 percent level), more than triple of the average effect estimated earlier and 4-5 times greater than the effect for the two lowest tariff brackets. The results for the probability of exporting in Column 3 of Table 9 follow the same pattern. The revocation of the highest tariff exemptions is associated with the largest (1.1 percentage points) decline in the probability of exporting.

Finally, the GSP utilization rates are considered in evaluating the expiration effect. Hakobyan (2015) documents a widespread underutilization of GSP benefits; only about 60 percent of GSP eligible exports in fact claim the duty-free treatment at the border. Therefore, the GSP expiration is more likely to affect those exporters that claimed the benefits prior to the expiration. To estimate the nonlinear impact of utilization, I interact the triple interaction term in equation (1) with three dummies for exports (a) that fully utilized GSP in 2010, (b) with partial average utilization, and (c) that didn't claim GSP

Table 9: The GSP Expiration Effect for Different Tariff Groups

Dependent Variable	<i>lnExports</i>		Export Dummy
	Point Estimate	Marginal Effect	
	(1)	(2)	(3)
Expired × Country × Product × Tariff Group Interaction			
0-3%	-0.024 (0.014)	-2.34%	-0.0021 (0.002)
3-6%	-0.029** (0.011)	-2.83%	-0.003** (0.001)
6-10%	-0.037** (0.018)	-3.66%	-0.0036* (0.002)
10-15%	-0.074** (0.036)	-7.09%	-0.0072* (0.004)
15+ %	-0.115*** (0.043)	-10.86%	-0.0108*** (0.004)
Observations	1,955,085		1,955,085

Notes: Regressions include country-product, country-year and product-year interactive fixed effects. Robust standard errors in parentheses are clustered by country and product. ***, ** and * indicate significance at the 1%, 5% and 10% level, respectively.

in 2010. I expect the GSP expiration effect to be increasing in the pre-expiration average utilization (across HS 8-digit products). The results reported in Table 10 confirm that the GSP expiration effect is greatest for exports with full pre-expiration utilization; the revocation of tariff exemptions as a result of GSP expiration induces about 77.5 percent drop in exports (statistically significant at the 1 percent level).²⁶ The results for the probability of exporting in Column 3 of Table 10 follow the same pattern. The revocation of the tariff exemptions for exports with full utilization is associated with the largest (16 percentage points) decline in the probability of exporting.

²⁶Using a continuous variable for the utilization rate instead of dummy variables to interact with the triple interaction term in equation (1) yields comparable results; the estimated effect when utilization rate is zero is not statistically different from zero, whereas the impact of GSP expiration when utilization rate is 1 is estimated at -62.9 percent. These results are available upon request.

Table 10: The GSP Expiration Effect for Different Utilization Rates

Dependent Variable	<i>lnExports</i>		Export Dummy
	Point Estimate	Marginal Effect	
	(1)	(2)	(3)
Expired × Country × Product × Utilization Dummy			
No utilization	0.0175 (0.014)	1.77%	0.002 (0.001)
Partial utilization	-0.366*** (0.043)	-30.6%	-0.034*** (0.004)
Full utilization	-1.493*** (0.096)	-77.5%	-0.159*** (0.01)
Observations	1,955,085		1,955,085

Notes: Regressions include country-product, country-year and product-year interactive fixed effects. Robust standard errors in parentheses are clustered by country and product. ***, ** and * indicate significance at the 1%, 5% and 10% level, respectively.

4.4 Indirect Effects of GSP Expiration

So far the results have suggested that the GSP expiration leads to a drop in exports from developing countries even though the collected duties have been reimbursed after the re-authorization of GSP. Important questions of interest are whether the exports from developing countries destined for the US but now facing tariffs due to GSP expiration get redirected to other destination markets and whether GSP expiration in any way benefits US domestic manufacturers producing GSP eligible products.

First, I explore the possibility of trade diversion from the US to the rest of the world due to GSP expiration. In particular, I examine whether the GSP expiration had any noticeable impact on exports from US GSP eligible countries to the 27 countries of the EU, another top export destination for developing countries. Using trade data from Eurostat for years 2010-2012, equation (1) is re-estimated with the dependent variable defined as exports to the EU. If US GSP expiration results in a trade diversion from the US to the EU, then the coefficients of interest are expected to be positive.²⁷

²⁷It is worth noting that the new rules of origin (ROs) of the EU GSP became effective on January 1, 2011, making the ROs less restrictive, especially for least developed countries (Inama, 2009). Such relaxation of

Table 11: Indirect Effects of GSP Expiration: Redirected Trade; Domestic Shipments

Dependent Variable	<i>lnExportsUS</i> Benchmark (1)	<i>lnExportsEU</i> Redirected trade (2)	<i>lnExportsUS</i> Benchmark (3)	<i>lnDomShip</i> Domestic shipments (4)
Marginal effect	-2.65%	-0.36%	-2.60%	25.9%
Expired × Country × Product	-0.027** (0.011)	-0.0036 (0.014)	-0.0264** (0.0114)	0.229*** (0.035)
Observations	1,622,048	1,622,048	1,767,510	8,622

Notes: Columns 1 and 2 use country-product pairs for which EU trade data are available. Column 1 re-estimates the benchmark specification for this subset of country-product pairs. In Column 2 the dependent variable is log exports to the EU. Columns 3 and 4 use only manufacturing data. Column 3 re-estimates the benchmark specification for this subsample. In Column 4 the dependent variable is log domestic shipments. Regressions in Columns 1-3 include country-product, country-year and product-year interactive fixed effects. Regression in Column 4 includes product and year fixed effects. Robust standard errors in parentheses are clustered by country and product in Columns 1-3 and by product in Column 4. ***, ** and * indicate significance at the 1%, 5% and 10% level, respectively.

The EU data at the HS 6-digit level are comparable to the US data, except for certain product categories that have been dropped from the analysis. For comparability, I report the US results estimated for this sample of country-product pairs in Column 1 of Table 11, followed by the EU results in Column 2. The US results are similar to the ones reported earlier, while the impact of GSP expiration on exports to the EU is not statistically different from zero, suggesting that the export responses reported earlier have not resulted in trade diversion to the EU.

Next, I examine the possibility that US domestic producers filled the void created by the GSP expiration and increased their shipments (net of domestic exports) in response to reduced exports from developing countries. I map the data on domestic shipments from the Annual Survey of Manufactures (ASM) from the Census Bureau which only cover manufacturing sector and are available at the NAICS 6-digit level to my main dataset at the HS 6-digit level. When there are multiple HS 6-digit products corresponding to a

ROs could have led to an increase in exports from developing countries to the EU, regardless of the status of US GSP. Thus, the estimated coefficient might capture both the US GSP expiration effect and the effect of the ROs reform under the EU GSP, assuming the set of products eligible for preferential treatment under the EU and US schemes is the same.

single NAICS 6-digit industry, I equally divide the value of shipments among HS 6-digit product categories. Two caveats are worth noting. First, the US domestic shipments net of domestic exports are at times negatively valued, and I drop these shipments from the analysis. Second, the US domestic shipments cover only the manufacturing sector, and after mapping into HS 6-digit product data, I exclude all agricultural products that fall within HS Chapters 1-15, and assume that the domestic shipments are zero if no data are reported for industries corresponding to products falling within HS Chapters 16 through 97.

I estimate a standard difference-in-differences using the log value of domestic shipments (net of exports) as a dependent variable and the interaction between the expiration dummy and GSP product eligibility as an explanatory variable. For comparison, Column 3 of Table 11 reports the results from the benchmark regression for the subsample of products for which domestic shipments data are available, followed by the results for US domestic shipments in Column 4. The results indicate that the GSP expiration is associated with greater domestic manufacturing shipments. In particular, domestic shipments increased by 25.9 percent, likely filling the void created by declining exports from GSP eligible developing countries.

5 Conclusion

This paper examines the impact of GSP expiration in 2011 on exports from developing countries to the US. Using a balanced panel of all US trading partners and all dutiable products, I employ the triple-differences approach to control for country-product specific general levels of exports, and country- and product-specific trends in exports.

The findings suggest that the GSP expiration had a significant impact on exports, lowering them by an average of 3 percent across all GSP products relative to the average level of exports in 2010 and 2012, including a 5 percent drop in agricultural products and a

larger 9 percent drop in textiles and clothing. In addition to lower levels of exports, I also find that the GSP expiration led to a narrower range of products being exported to the US. In particular, the probability of exporting textiles and clothing products decreases by 1.25 percentage points compared to the average probability of 2.6 percent for GSP countries exporting these products prior to the expiration. The GSP expiration had a disproportionate impact on products facing higher tariffs, with the highest tariff group (15% and above) experiencing 11 percent drop in exports. It has also been associated with a larger 77.5 percent drop in exports that fully utilized the GSP benefits prior to its expiration. The effect of the 2011 expiration appears to be quite persistent even after the GSP is renewed; the exports in 2011 and 2012 are 4.9 and 4.25 percent lower, respectively, relative to the pre-expiration level of exports. The magnitude of the effect of the 2011 expiration is comparable to that of the 1995-96 and 2013-15 expiration episodes, the longest periods of expiration in the history of US GSP. Although GSP expiration has not resulted in a diversion of the affected exports from the US to the EU market, I find a significant expansion of US domestic manufacturing shipments at the time of GSP expiration.

The findings in this paper suggest that even though the duties paid during the period of GSP expiration may ultimately be reimbursed to exporters after the GSP is renewed retroactively, the GSP preferences matter for exporters in accessing the US market and they are less likely to continue exporting in the absence of preferential treatment, even for a short period of time.

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Appendix

Figure A1: Kernel Density of Estimated Effects Across Countries

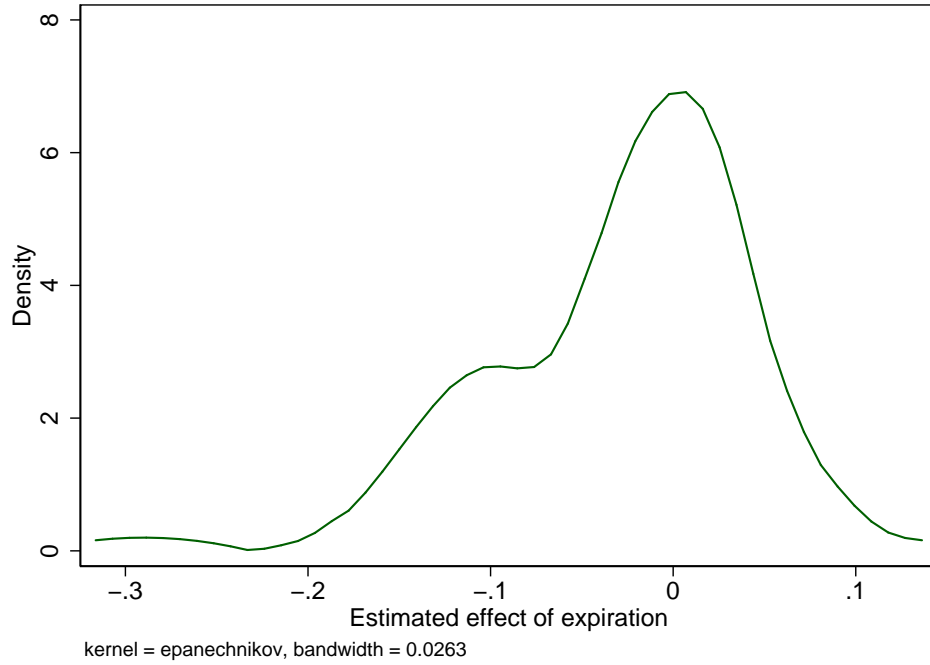


Figure A2: MFN Tariff Rate Distribution in 2010

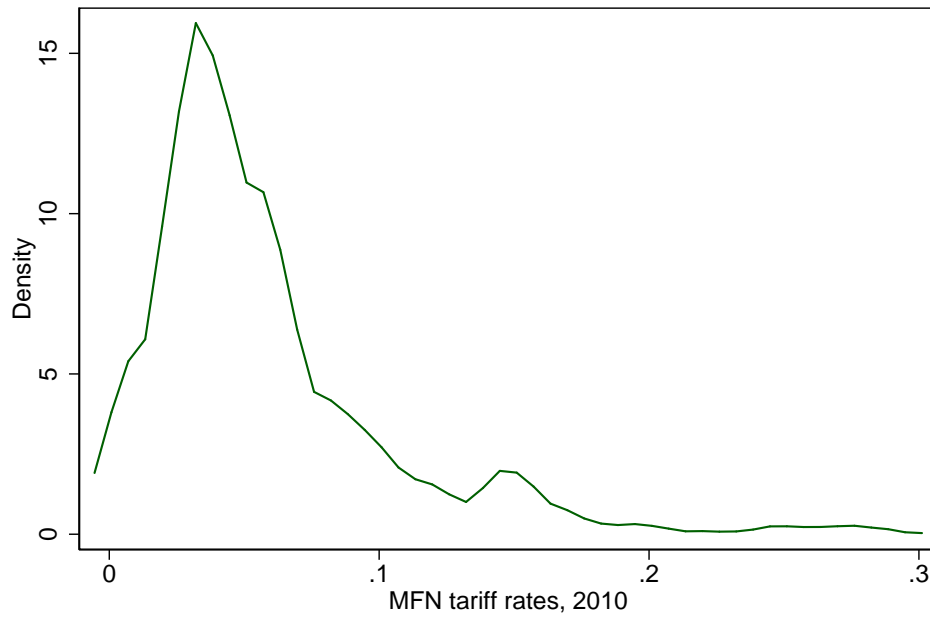


Table A1: GSP Implementation and Expiration

Effective Date	Date Expired	Period of Expiration	No of Days Expired
Jan 2, 1975	Jan 2, 1985	...	
Oct 30, 1984	Jul 4, 1993	Jul 5, 1993 - Aug 10, 1993	36
Aug 10, 1993	Sep 30, 1994	Oct 1, 1994 - Dec 8, 1994	68
Dec 8, 1994	Jul 31, 1995	Aug 1, 1995 - Oct 1, 1996	437
Oct 1, 1996	May 31, 1997	Jun 1, 1997 - Aug 5, 1997	65
Aug 5, 1997	Jun 30, 1998	Jul 1, 1998 - Oct 21, 1998	112
Oct 21, 1998	Jun 30, 1999	Jul 1, 1999 - Dec 17, 1999	169
Dec 17, 1999	Sep 30, 2001	Oct 1, 2001 - Aug 6, 2002	309
Aug 6, 2002	Dec 31, 2006	...	
Dec 31, 2006	Dec 31, 2008	...	
Oct 16, 2008	Dec 31, 2009	...	
Dec 28, 2009	Dec 31, 2010	Jan 1, 2011 - Nov 5, 2011	308
Nov 5, 2011	Jul 31, 2013	Aug 1, 2013 - Jul 28, 2015	726
Jul 29, 2015	Dec 31, 2017	Jan 1, 2018 - Apr 22, 2018	111

Table A2: The GSP Expiration Effect for LDBC and DBCs (two-way balanced panel)

	<i>lnExports</i>	
	Point Estimate	Marginal Effect
Expired × DBC × DBC Product	-0.213*** (0.078)	-19.2%
Expired × LDBC × LDBC Product	-0.161 (0.391)	-14.9%
Observations	331,017	

Notes: The sample is restricted to products that are observed being exported at least once during the sample period by each country. Regressions include country-product, country-year and product-year interactive fixed effects. Robust standard errors in parentheses are clustered by country and product.

***, ** and * indicate significance at the 1%, 5% and 10% level, respectively.

Table A3: The GSP Expiration Effect for Different Product Categories (two-way balanced panel)

	<i>lnExports</i>	
	Point Estimate	Marginal Effect
Expired \times Country \times Product Interaction		
Agriculture	-0.406** (0.159)	-33.4%
Fuels and Minerals	-0.338 (0.266)	-28.7%
Textiles and Clothing	-0.441* (0.249)	-35.7%
Manufacturing (excluding textiles/clothing)	-0.171** (0.084)	-15.7%
Observations	331,017	

Notes: The sample is restricted to products that are observed being exported at least once during the sample period by each country. Regressions include country-product, country-year and product-year interactive fixed effects. Robust standard errors in parentheses are clustered by country and product. ***, ** and * indicate significance at the 1%, 5% and 10% level, respectively.

Table A4: The GSP Expiration Effect for Different Tariff Groups (two-way balanced panel)

	<i>lnExports</i>	
	Point Estimate	Marginal Effect
Expired \times Country \times Product \times Tariff Group Interaction		
0-3%	-0.171 (0.112)	-15.7%
3-6%	-0.203** (0.088)	-18.4%
6-10%	-0.315** (0.159)	-27.0%
10-15%	-0.502 (0.329)	-39.5%
15+ %	-1.771* (0.920)	-83.0%
Observations	331,017	

Notes: The sample is restricted to products that are observed being exported at least once during the sample period by each country. Regressions include country-product, country-year and product-year interactive fixed effects. Robust standard errors in parentheses are clustered by country and product. ***, ** and * indicate significance at the 1%, 5% and 10% level, respectively.

Table A5: The GSP Expiration Effect for Different Utilization Rates (two-way balanced panel)

	<i>lnExports</i>	
	Point Estimate	Marginal Effect
Expired × Country × Product × Utilization Dummy		
No utilization	0.601*** (0.133)	82.4%
Partial utilization	-0.481*** (0.078)	-38.2%
Full utilization	-1.637*** (0.105)	-80.5%
Observations	331,017	

Notes: The sample is restricted to products that are observed being exported at least once during the sample period by each country. Regressions include country-product, country-year and product-year interactive fixed effects. Robust standard errors in parentheses are clustered by country and product. ***, ** and * indicate significance at the 1%, 5% and 10% level, respectively.