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Effect of the Duty-Free Quota-Free Market access Schemes in favour of Least developed countries' Products on the Volatility of the Utilization Rate of these Schemes

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Abstract

Members of the World Trade Organization (WTO) accord a special attention to the integration of the least developed countries (LDCs) into the global trading system. A major Decision in favour of LDCs adopted by WTO Trade Ministers was the one concerning the Duty-Free-Quota-Free (DFQF) market access for products originating in LDCs. The Decision requests that developed-country Members, and developing-country Members in a position to do so, to provide DFQF market access for at least 97% of products originating from LDCs. The present paper investigates whether the DFQF market access schemes offered by the Quadrilateral (i.e., Canada, the European Union, Japan and the United States) to LDCs have helped reduce the volatility of the utilization rates of these generous preferences. The theoretical hypothesis tested is that the minimum target of '97%' and the unlimited duration of the schemes (as long as beneficiaries do not lose the LDC status) have increased the market access predictability as well as the potential benefits of the schemes for LDCs' trading firms, and could hence result in a lower volatility of LDCs' utilization of these schemes. To perform the analysis, we compare LDCs' performance in terms of the volatility of the utilization rate of the DFQF market access schemes with the performance of other designated LICs by the International Monetary Fund, that did not the benefits of the DFQF schemes, and whose products enjoyed less generous preferential treatment. The comparison of the performance of these two groups was made over the period from 2014 to 2019 versus the period from 2004 to 2013. Results have lent credence to the theoretical hypothesis by revealing that the DFQF market access initiative has genuinely been instrumental in reducing the volatility of the utilization rate of these generous preferences schemes in LDCs. The policy implications of the analysis are discussed.

Keywords: DFQF market access; Volatility of the utilization of DFQF market access schemes; Least developed countries; Difference-in-Difference approach.

Jel Classification: F13; F14.

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1. Introduction

The Generalized system of Preferences (GSP) are non-reciprocal trade preferences (NRTPs) offered by industrialized countries to products originating from developing countries. The reference to these preferences was initially made in the Resolution² 21 (II) adopted by the second conference of the United Nations Conference on Trade and Development (UNCTAD) held in 1968. According to Resolution 21 (II), non-reciprocal trade preferences are provided to developing countries, with a view to helping them 'increase export earnings, promote industrialization and accelerate economic growth rates' (see Grossman and Sykes 2005). The Enabling Clause³, established in 1979, provides for the permanent legal basis for granting unilateral trade preferences to developing countries.

In addition to GSPs, other NRTPs for goods are authorised through a Waiver under the World Trade Organization (WTO) Agreement⁴ (see WTO, 2010). For example, in addition to the generous preferential treatment provided by developed countries to least developed countries (LDCs) (as a sub-scheme of the GSP scheme), developed countries can also offer special treatment to products originating from a set of selected countries⁵, and developing countries can supply special treatment to products originating in LDCs⁶.

The international community, including the members of the WTO, have paid special attention to LDCs (e.g., United Nations, 2021; UNCTAD, 2021, WTO, 2022), in view of their very low integration into the global trading system (WTO, 2021a, 2021b). According to the WTO, LDCs' share of exports of goods and commercial services in world exports of goods and commercial services reached 0.96% in 2019 against 0.92% in 2017, but fell back to 0.91% in 2020, due to the adverse trade effects of the COVID-19 pandemic (see WTO, 2021a).

In view of this situation, WTO Members have accorded many flexibilities to LDC governments across various WTO Agreements (WTO, 2021c) so as to facilitate the implementation of those agreements and enhance their participation in international trade. As far

² See the document "Preferential or Free Entry of Exports of Manufactures and Semi-Manufactures of Developing Countries to the Developed Countries, the United Nations Conference on Trade and Development Resolution 21(II) (adopted by the General Assembly, 26 March 1968).

³ The Enabling Clause is also referred to as "Differential and More Favourable Treatment, Reciprocity and Fuller Participation of Developing Countries".

⁴ Information on old and existing NRTPs is provided by the WTO and accessible online at: <http://ptadb.wto.org/>

⁵ For example, the United States provides the African Growth and Opportunity Act (AGOA) to eligible countries in Sub-Saharan Africa. The European Union provides a special preferential treatment for products originating from the Western Balkans, and Canada offers a tariff treatment to products from Commonwealth Caribbean countries.

⁶ This is authorized by the Waiver Decision adopted by the General Council of the WTO concerning the Preferential Tariff Treatment for Least developed countries. The Decision allows this Waiver to last until 30 June 2029 (see WTO, 2019b).

as market access issue is concerned, WTO Members adopted several Decisions in favour of LDCs. The landmark Decision concerns the provision by WTO Members of duty-free and quota free (DFQF) market access to products exported by LDCs. This was the Decision 36 of Annex F contained in 'Trade Ministers' Declaration at the WTO Hong Kong Ministerial Conference in 2005. The Decision aims at reducing the uncertainty of market access for products originating in LDCs (see WTO, 2005: Decision 36 of Annex F). Especially, it provides, *inter alia*, that developed-country Members, and developing-country Members declaring themselves in a position to do so shall "provide duty-free and quota-free market access on a lasting basis, for all products originating from all LDCs by 2008 or no later than the start of the implementation period in a manner that ensures stability, security and predictability" (see paragraph (a) (i) of Annex F). It, additionally, requests that "developed-country Members and developing-country Members facing difficulties at this time to provide market access as set out above shall provide duty-free and quota-free market access for at least 97 per cent of products originating from LDCs, defined at the tariff line level, by 2008 or no later than the start of the implementation period. These Members shall also take steps to progressively achieve compliance with the obligations set out above, taking into account the impact on other developing countries at similar levels of development, and, as appropriate, by incrementally building on the initial list of covered products." (see paragraph (a) (ii) of Annex F). Interestingly, the Decision 36 of Annex F provides that "developed-country Members shall, and developing-country Members declaring themselves in a position to do so should ensure that preferential rules of origin applicable to imports from LDCs are transparent and simple, and contribute to facilitating market access" (see paragraph (b) of Annex F).

At the Bali Ministerial Conference held in 2013, WTO Trade Ministers adopted another Decision to further enhance market access for products exported by LDCs. This Decision recognizes the significant progress made by Members since the adoption of the Hong Kong Decision, towards the goal of providing DFQF market access on a lasting basis for all products originating from all LDCs. It has reaffirmed the Hong Kong Ministerial Decision, by *inter alia*, calling on developed country Members (and developing country Members in a position to do so) that have not yet provided DFQF market access for at least 97% of products originating from LDCs (defined at the tariff line level) to seek to improve their existing DFQF coverage for such products.

The requirement by both the Hong Kong and Bali Ministerial Decisions that DFQF market access be provided for at least 97% of products originating from LDCs is likely to have contributed to mitigating the uncertainty (i.e., improving the predictability) of market access for products exported by LDCs. This certainty would be further enhanced if the Nairobi Ministerial Decision

adopted by WTO Members to simplify rules of origin governing Members' DFQF schemes (see WTO, 2015) were fully implemented by preference-granting countries. The list⁷ of the major multilateral non-reciprocal LDC preference schemes undertaken by Members as of 2021 is contained in document WTO (2021a: page 41-42, Annex Table 6.

Some studies have considered whether the DFQF market access Decisions have been effective in promoting LDCs' goods exports (e.g., Bouët et al., 2010; Dowlah, 2008; Gnanon and Priyadarshi, 2017; Gradeva and Martínez-Zarzoso, 2019; Ito and Aoyagi, 2019). Dowlah (2008) has recommended, inter alia, that the effectiveness of GSP schemes would be improved if greater financial resources were devoted to overcoming supply constraints in the LDCs, and developed countries granted unwavering market access for products originating from LDCs. Along the same lines, Bouët et al. (2010) have shown that if developed countries and developing ones had improved their market access for products originating from LDCs, the latter's exports would have increased substantially. Gnanon and Priyadarshi (2017) have shown empirically that the multilateral DFQF market access Decision in favour of LDCs has yet promoted the countries' exports, but it has led to higher exports of primary products than manufactured products. Other studies have pointed out that the DFQF market access initiative has promoted LDCs' exports (e.g., Gradeva and Martínez-Zarzoso, 2019; Ito and Aoyagi, 2019).

Meanwhile, little attention has been paid to the question as to whether the DFQF market access initiative has helped reduce the volatility of the utilization by LDCs of the preferences that they have enjoyed. In fact, the volatility of export revenue can undermine the efforts by trading firms, including risk-adverse ones, for planning and undertaking investments in the export sectors (Agosin, 2009), reduce terms of trade gains, increase macroeconomic uncertainty, encourage corruption, and lower economic growth prospects (e.g., Araujo et al., 2019; Bleaney and Greenaway, 2001; Cariolle, 2013; Ghosh and Ostry, 1994; United Nations, 2014).

The present analysis purports to fill this void in the literature by investigating the effect of the DFQF Decisions on the volatility of the utilization rates of GSP programs by LDCs. In particular, it explores how LDCs have fared in terms of the volatility of the utilization rates of GSP programs, compared to other low-income countries (notably the ones designated as such by the International Monetary Fund - IMF) that have not benefited from the DFQF market access initiative. These LICs are considered as low-income ones because they are eligible for the Poverty Reduction and Growth Trust (PRGT) facilities of the IMF.

⁷ Detailed information on old non-reciprocal trade preferences and those currently in force is provided by the WTO in its dedicated Preferential Trade Arrangements (PTA) database. It is accessible online at: <http://ptadb.wto.org/>

To perform the analysis, the paper has used the recent dataset developed by the United Nations Conference on Trade and Development (UNCTAD) on the utilization rates of GSP programs and other trade preference programs offered by the 'trade' Quadrilaterals (i.e., QUAD countries that include Canada, the European Union, Japan, and the United States).

As noted above, the first DFQF market access Decision in favour of LDCs was adopted in 2005, and has increased incentives of WTO members to offer DFQF market access to products originating from LDCs. At the same time, the Bali Ministerial Decision on DFQF market access for LDCs has further incentivized those WTO members that were already offered DFQF market access of at least 97% of products exported by LDCs, to further improve the products coverage of the scheme, and those that had not started providing such preferences to LDCs to start doing so. Against this background, one could expect that the present analysis would compare the performance of LDCs and other LICs (of the IMF) after 2005 (i.e., the year of the first DFQF market access Decision) to the period preceding 2005. However, the dataset made available by UNCTAD on the utilization rates of GSP programs and other trade preferences programs covers the period from 2002 onwards. It was impossible from the empirical perspectives to perform the analysis over the period from 2006 onwards versus the period from 2002 to 2005.

Therefore, we opt for using the year '2013' as the reference year for performing the empirical analysis on the causal effect of the DFQF market access initiative on the instability of the utilization rates of the QUAD's GSP programs in LDCs versus other LICs. To recall, the year '2013' is the one during which the second DFQF market access Decision (i.e., the Bali ministerial Decision) was adopted. In other words, the empirical analysis involves comparing the performance of LDCs⁸ in terms of the volatility of the utilization rates of DFQF outcomes to that of other LICs⁹, in the period from 2013 to 2019 versus the period preceding 2013. This analysis, is therefore, akin to an one performed using the difference-in-difference framework. As a matter of fact, it is not entirely an analysis that involves the use of the Difference-in-Difference framework because the treatment period runs from 2013 onwards, whereas it should be the period running from 2005 onwards, since the first DFQF market access Decision in favour of LDCs was adopted in 2005.

Using a panel dataset that contains a total of 61 countries, of which 40 LDCs and 21 other LICs (as defined by the IMF), the empirical analysis has provided strong evidence that the DFQF market access initiative has been instrumental in reducing the instability of the utilization rates of the DFQF preferences programmes offered to LDCs under the GSP programs. In other words,

⁸ These countries are, de facto, benefited from the DFQF market access initiative.

⁹ These countries have, de facto, not benefited from the DFQF market access Decisions, because they are not in the category of LDCs.

the DFQF market access initiative has allowed LDCs to perform better than other LICs (that did not benefit from these preference schemes) in terms of reducing the instability of the utilization of the DFQF market access schemes.

The rest of the paper is structured around five sections. Section 2 discusses how by improving the predictability of market access for products exported by LDCs, the DFQF market access initiative can help reduce the volatility of the utilization rate of the DFQF schemes offered by QUAD countries to LDCs. Section 3 presents the model specification that will be used to test our theoretical hypothesis. Section 4 discusses the econometric techniques utilized to estimate the model, and Section 5 interprets empirical outcomes. Section 6 goes deeper into the empirical analysis, and Section 7 concludes.

2. Uncertainty of market access and the instability of the utilization of non-reciprocal preferences

The literature has pointed out that several factors can limit the utilization of the non-reciprocal preferences, including GSP programs. These include, for example, the erosion of the preferences margins as a result of greater multilateral trade liberalization (e.g., Persson, 2015a; Reynolds, 2009), the limited supply response capacity, and the trade policies implemented by beneficiary countries (e.g., Collier and Venables, 2007; Gradeva and Martínez-Zarzoso 2016; Low et al. 2009), the product coverage of the scheme (as defined by the preference-granting countries), the stringency (restrictiveness) of rules of origin governing the scheme, side conditions related to human rights and labour conditions that are often more stringent than international related rules, and the certainty (or stability) of market access covered by the scheme¹⁰ (e.g., Brenton, 2003; Compa and Vogt, 2005; Persson, 2015a; WTO, 2019a).

In general, non-reciprocal preference schemes, including GSP programs typically are not permanent programs, but subject to periodic legislative renewals (e.g., Brenton and Ikezuki, 2005; Hakobyan, 2020). The issue of market access certainty (or stability) both in terms of duration and product coverage, is particularly relevant for trading firms in beneficiary countries. The legally non-binding nature of the non-reciprocal preference programs confers to preference granting countries some discretion over the choice of countries and products that are included in their schemes, the preferential rules that govern the provision of preferences, and the criteria of graduation from the program (e.g., Brenton and Ikezuki, 2005; Grossman and Sykes 2005; Persson, 2015a; Hakobyan,

¹⁰ The application of these conditions from the preference-granting side introduces de facto an important element of reciprocity into the GSP (e.g., Grossman and Sykes, 2005).

2017). Such a discretion creates uncertainty over the benefits of the programs for trading firms in developing countries. It can distort the economic structure and trading patterns of GSP receiving countries in the long-run (e.g., Hoekman and Özden, 2006; Panagariya, 2004), reduce these firms' incentives to make long term investments in products eligible for the preferential regime, limit the expansion of their product scope, and discourage innovation (e.g., Borchert and Di Ubaldo, 2020; Persson, 2015a,b). For example, Panagariya (2004) has argued that the termination of a GSP scheme at short notice may result in an overcapacity and a production structure in beneficiary countries that might not reflect their particular comparative advantages under free trade. Herz and Wagner (2011) have concluded that these distortions increase countries' incentives to export under most favoured nations tariffs rather than under the non-reciprocal GSP programs. These aspects of uncertainty would ultimately undermine both the development scope and the effectiveness of GSP schemes (e.g., Borchert and Di Ubaldo, 2020). Brenton and Ikezuki (2005) have argued that the removal of the sources of uncertainty concerning product and country coverages and the duration of preference schemes would enhance the value of preferences under current export structures.

In this regard, Bartels and Häberli (2010) have proposed that binding obligations in existing WTO rules be used as a tool for increasing the predictability of market access. Onguglo (1999) has recommended that to the extent that most non-reciprocal preferences have multi-year durations, a multi-year waiver of a reasonable duration would help ensure a long term obligation on part of preference-granting countries. It would help reduce the uncertainty and apprehension among beneficiaries and their trading firms with regard the security and the stability of the preferential market access. As result, trading firms in beneficiary countries could undertake longer term investment decisions in the sectors that are covered by the preferences schemes, as well as in other related sectors in the economy. In the same vein, Persson (2015a) has underlined the difficulties for firms to take advantage of a market access agreement that last only a few years compared to a one with unlimited duration. UNCTAD (2003) has proposed that to ensure stable benefits for beneficiary countries, preference granting countries should develop enforceable and durable GSP arrangements that cannot be cancelled ad hoc, cover all products from developing countries, while relying on simple rules of origin. Herz and Wagner (2011) and Persson (2015b) have, nevertheless, cautioned that while the implementation of these recommendations by the UNCTAD can mitigate some of the symptoms of the GSP programs, the fundamental problems, including the ones related to uncertainty from the beneficiary countries' side would likely remain.

The empirical literature has also touched upon the relevance of ensuring the predictability of the market access (both in terms of duration and product coverage) for trading firms in

beneficiary countries. For example, Borchert and Di Ubaldo (2020) have shown that the reform by the European Union (EU) of its GSP scheme in 2014, in particular the removal of this criterion¹¹ of competitiveness, has led to an increase in EU imports from the beneficiary countries of the reformed GSP scheme by about 7% on average, whilst tariffs remained unchanged. This positive effect of the reform is essentially driven by the country-sector pairs most exposed to the uncertainty that prevailed before the reform. In other words, the enhancement of the predictability of the EU's GSP scheme through the removal of some uncertainty associated with the old GSP scheme, has led to a significant increase in exports by beneficiaries of this scheme. Gnutzmann-Mkrtchyan and Volmer (2022) have, nevertheless, shown that the post-2014 EU's GSP scheme has resulted in lower exports of some developing countries who lost access to the benefits of the GSP scheme. These countries could eventually more than compensate for these losses by entering into bilateral trade agreements with the EU.

Hakobyan (2020) has obtained that the 2011 expiration of the United States GSP has had adversely affected developing countries' exports to the market of the United States. Moreover, the adverse export effects of the 2011 expiration of the US GSP has been persistent over time because exports did not fully recover by 2012.

Klasen et al. (2021) have put forth the argument that LDC status will have a strong export promotion effect because it potentially reduces the uncertainty surrounding exports attached to a particular GSP scheme, the latter being subject to a periodic revision, while also depending on the decision of preference-granting countries. On the other side, the graduation from LDC status is unlikely to take place in the short term, and depends on the members of the United Nations decision in this regard. The authors have found empirically that compared to the non-LDC status, the LDC status has helped LDCs strongly promote their aggregated exports, including their agricultural and light manufacturing products, and for the latter, textiles and leather after 1990. These export advantages of the LDC status are particularly larger when a trade preference scheme is not operating effectively. On another note, GSP programs have promoted exports from developing countries (both LDCs and non-LDCs), although the results are heterogeneous and vary across preference-granting countries, and the sector of exports considered.

In light of the foregoing, we submit the hypothesis that by establishing a minimum target (i.e., 97%) for the products coverage under the DFQF preference schemes, and by allowing an

¹¹ The European Union undertook in 2014 a reform of its GSP scheme, which involves, inter alia, the removal of the criteria whereby countries that are not too competitive could benefit from the scheme. The competitiveness criterion is that a country's share of EU GSP imports in a sector exceeds a certain threshold.

unlimited duration of the benefits of these schemes¹², the DFQF market access Decisions have increased the predictability of market access for products exported by LDCs to preference-granting countries. In other words, these Decisions have reduced the uncertainty of the benefits of these preferences, and likely incentivized LDCs' exporting firms (including both local firms and multinational firms that wish to take advantage of these schemes) to undertake long term investments in the export sectors. In turn, this would contribute to dampening the instability of the utilization rates of these preferences (especially the ones offered by the QUAD countries). The next section will test this hypothesis.

3. Model specification

Several works have explored the determinants of the instability of goods exports, either at the macro-level (e.g., Chowdhury et al., 2021; Gnanon, 2018; Han, 2021; Mansfield and Reinhardt, 2008) or at the firm-level (e.g., Hirsch and Lev, 1971; Juvenal and Monteiro, 2013; Kramarz et al. 2020; Vannoorenberghe et al., 2016).

We build on these works and postulate the following parsimonious model:

$$URGSPVOL_{it} = \beta_0 + \beta_1[(LDC_i) * (DFQF_t)] + \beta_2LDC_i + \beta_3DFQF_t + \beta_4Log(ODA)_{it-3} + \beta_5Log(GDPCAP)_{it-3} + \beta_6INST_{it-3} + \beta_7FINDEV_{it-3} + \mu_i + \epsilon_{it}$$

(1)

The dependent variable "URGSPVOL" is for a given country i , and a given year, t the indicator of the volatility of utilization rate of the GSP preferences. It is important to note here that for LDCs, the preferences are essentially DFQF market access schemes offered by QUAD countries, while for other LICs. These preferences are less generous than those offered to LDCs by the QUAD countries under their respective GSP programs.

The variable "URGSPVOL" has been calculated using the indicator of the utilization rate of GSP programs (denoted "URGSP") whose values range between 0 and 100, with higher values indicating a greater utilization rate of GSP programs (see Appendix 1 for details on the variable "URGSP"). To compute the indicator "URGSPVOL", we first calculate the standard deviation over 3-year rolling windows¹³ (that is, from $t-2$ to t) of the growth rate of the utilization rate of

¹² The benefits of the DFQF market access schemes exclusively accrue to LDCs. Thus, once an LDC graduates from the LDC category, it may lose access to the benefits of these programs. The criteria of countries' graduation from the LDC category are provided by the United Nations and can be found online at: <https://www.un.org/development/desa/dpad/least-developed-country-category/ldc-graduation.html>

¹³ We use the 3-year rolling windows because of the short time span of the dataset used in the analysis.

GSP programs¹⁴. The computed indicator is denoted "URGSPVOL1". As it contains many zeros, and displays a highly skewed distribution, it has been transformed using the approach proposed by Yeyati et al. (2007): $URGSPVOL = \text{sign}(URGSPVOL1) * \log(1 + |URGSPVOL1|)$, where $|URGSPVOL1|$ refers to the absolute value of the variable "URGSPVOL1". Higher values of the indicator "URGSPVOL" indicate greater volatility of the utilization rate of GSP programs.

It is important to note here that data on the utilization rate of the DFQF market access schemes offered by QUAD countries under their GSP programs were initially available for the period 2002-2019. However, as the volatility of the utilization rates of GSP programs has been computed using the rolling standard deviation with a three-year window, we lost two years. As a result, data ultimately cover the period from 2004 to 2019, and prevents us from examining the effect of the DFQF market access initiative on the volatility of the utilization of these preferences by LDCs versus other LICs, in the period 2005-2019 versus the pre-treatment period. For these reasons, we use the year '2013' as the reference year, i.e., we focus on the period 2014-2019 versus the period from 2004 to 2013.

Appendix 1 contains the description of all variables introduced in model (1). The panel dataset is unbalanced and contains overall 61 countries, of which 40 LDCs and 21 other LICs, the latter being those¹⁵ eligible for the Poverty Reduction and Growth Trust facilities of the IMF (see IMF, 2021: p34). Appendix 2 reports the list of each of these sets of countries. β_0 to β_7 are parameters that we will estimate later in the analysis. μ_i are time invariant countries' fixed effects. ϵ_{it} is a well-behaving error-term. The variable "LDC" is a dummy variable, which takes the value of 1 for LDCs in the full sample, and 0, otherwise (i.e., 0, for other LICs). The variable "DFQF" is the dummy variable representing the period from 2014 onwards, i.e., it takes the value of 1 from 2014 to 2019 and 0 from 2007 to 2013.

The parameter β_1 captures the extent to which the volatility of the utilization of these preferences in LDCs is due to DFQF market access initiative. In other words, it captures the net effect of the DFQF market access initiative on the volatility of the utilization of these preferences in LDCs. A positive and significant coefficient β_1 (at least at the 5% level) would indicate that the DFQF market access schemes offered by the QUAD countries to LDCs has enhanced the volatility of the utilization of these programs over the period from 2014 to 2019 compared to the

¹⁴ Bayraktar (2019), Bekaert et al. (2006), Ebeke and Ehrhart (2012), Gnangnon (2021), and Museru et al. (2014) have also used the approach in their respective analyses.

¹⁵As of 2021, 69 LICs were considered by the IMF as eligible for the Poverty Reduction and Growth Trust facilities (see IMF, 2021: p34). The 21 LICs used in the present study are among the 69 LICs those that are not classified as LDCs by the United Nations.

period from 2004 to 2013. In contrast, a negative and significant coefficient β_1 (at least at the 5% level) would indicate that the DFQF market access schemes offered by the QUAD countries to LDCs has been instrumental in dampening the instability of the utilization of the DFQF market access programs offered by the QUAD countries, including over the period from 2014 to 2019 compared to the period from 2004 to 2013.

The real per capita income denoted "GDPC", is a proxy for countries' development level, and aims to captures the possible differentiated effect of the DFQF market access schemes on the volatility of the utilization of these schemes across countries in the sample.

The variable "ODA" is the real net disbursements of total official development assistance (ODA), expressed in constant prices 2019, US dollar. It has been introduced in model (1) because the literature has found that development aid is critical for enhancing the resilience of countries' exports to external shocks. For example, Guillaumont and Le Goff (2010) have demonstrated that development aid has been instrumental in dampening the volatility of goods and services exports. Gnangnon (2022) has provided empirical evidence that by contributing to the development of productive capacities in recipient countries, development aid has helped them strengthen the exports resilience to exogenous external shocks. Therefore, we expect that higher development aid inflows would be negatively associated with the volatility of utilization rates of DFQF market access schemes by LDCs.

The natural logarithm has been applied to the variables "ODA" and "GDPCAP" in model (1), with a view to reducing the skewness of their distributions.

A greater financial development can dampen the volatility of the utilization rates of DFQF market access schemes by LDCs if it facilitates trading firms' access to the credit supplied by the domestic banking system, particularly when economies (and notably, these firms) are hit by adverse shocks. For example, Bems et al. (2013) have noted that shocks to credit supply have amplified the decline in trade flows in the wake of the 2008-2009 global recession. Auboin (2009, 2011) has argued that the decline in trade finance further to adverse shocks results in a significant drop in trade flows. In this scenario, a greater financial development could exert a dampening effect on the volatility of utilization rates of DFQF market access schemes by LDCs. Conversely, the deepening of domestic financial markets can also result in a greater financial vulnerability, which exposes countries to financial crises (e.g., Binici and Ganioglu, 2021; Mathonnat and Minea, 2018). In this case, greater financial development would likely enhance the instability of the utilization rates of DFQF market access schemes that LDCs enjoy. Overall, the net effect of financial development on the instability of the utilization rates of DFQF market access by LDCs is to be determined empirically.

Finally, one could also expect that the improvement in the institutional and governance quality would be negatively associated with the instability of the utilization rates of DFQF market access by LDCs. This is because the improvement in the quality of institutions and governance allows countries to mitigate the negative economic effects of adverse shocks (e.g., Acemoglu et al., 2003; Caldera Sánchez and Röhn, 2016), and hence their effects on exports.

Control variables have been introduced in model (1) at the year $t-3$ to ensure their exogeneity with respect to the dependent variable. The descriptive statistics of all variables contained in this model, over the full sample, as well as the treatment and control groups are reported respectively in Appendices 3a, 3b and 3c. Especially, Appendix 3a shows that over the full sample and the full period, the volatility of the utilization rate of GSP preferences had been very high, as the values of the indicator "URGSPVOL1" (i.e., the non-transformed indicator of the volatility of the utilization rate of GSP programs) range between 0 and 1531.9, with the average being 5.93 and the standard deviation amounting to 62. These statistics reflect a higher volatility of the utilization rate of GSP programs by other LICs than by LDCs, as exemplified by statistics concerning the indicator "URGSPVOL1" in Appendices 3a and 3b. Especially, the values of the indicator "URGSPVOL1" in the LDCs (see Appendix 3a) range between 0 and 391.6, with the mean and the standard deviation being respectively 4.56 and 31.2. For other LICs, the values of "URGSPVOL1" (see Appendix 3b) range between 0 and 1531.9, with the mean and the standard deviation amounting respectively 8.5 and 96.6.

[Insert Figure 1, here]

Before discussing the econometric approaches used to estimate model (1), we find useful to provide an insight into the developments of the indicator "URGSPVOL" over LDCs and other LICs. Figure 1 provides these developments over the period from 2004 to 2019. It shows that while between 2004 and 2007, the volatility of the utilization rate of GSP preferences programs was higher in other LICs than in LDCs, the pattern reversed between 2007 and 2011, as over this sub-period, LDCs experienced a higher volatility of the utilization rate of the GSP preferences (i.e, the DFQF market access schemes) than other LICs. Interestingly, we notice that from 2013 to 2019, the volatility of the utilization rate of the GSP preferences by other LICs has been far higher than that of LDCs. Moreover, over the period from 2013 to 2019, the volatility of the utilization rate of the DFQF market access schemes offered to LDCs was declining, while the volatility of the utilization rate of GSP preferences by other LICs tended to increase. This difference in the fluctuations of the utilization rates of GSP programs in LDCs and other LICs over the period from 2013 to 2019 may reflect the fact that the DFQF market access schemes offered to LDCs by QUAD countries has exerted a higher dampening effect on the volatility of the utilization rates

of these preferences by LDCs than that of other LICs that received a less generous non-reciprocal preferential treatment. This observation provides a first support to the hypothesis set out in section 2, whereby the predictability of the market access under the DFQF market access schemes for LDCs is likely to result in a lower volatility of the utilization rates of these non-reciprocal preferences in LDCs than in other LICs (whose products enjoy a less generous preferential treatment in the market of the QUAD countries).

4. Empirical approach

We estimate model (1) using three different estimators, including the within fixed effects (FEDK) estimator, the random-effects Mundlak estimator (Mundlak, 1978), and the feasible generalized least squares (FGLS) estimator. In the presence of heteroskedasticity, serial and cross-sectional correlations, the FGLS estimator generates estimates more efficient than those of the ordinary least squares (e.g., Bai et al., 2021; Zellner, 1962). In using the within fixed effects estimator, we correct the estimates' standard errors by applying the technique proposed by Driscoll and Kraay (1998). This technique allows handling the autocorrelation, heteroscedasticity, and any form of cross-sectional dependence in the error-term.

In contrast with the within effects estimator that takes into account the within-country variations of variables (and hence disregards the between-country variations of variables), the random-effects Mundlak model allows accounts for differences within and between-country effects. For example, in the present analysis, the FEDK estimator would not allow obtaining the coefficient of the dummy "LDC", whereas the random effects Mundlak approach would allow getting it. The random effects Mundlak technique is a hybrid approach, which consists of including in the random effects specification, variables that capture the correlation between (time-varying) regressors and individual effects. Hence, it assumes that the unobserved heterogeneity depends on the country-level time averages of regressors. In other words, the random-effects Mundlak model entails estimating a random effects specification that contains, in addition to the vector of regressors, the time-averaged¹⁶ regressors, with the latter allowing to control for time-invariant unobserved heterogeneity (between effects) in the regressions.

We estimate model (1) using each of these three estimators. Results in columns [1], [2] and [3] of Table 1 arise from the estimation of model (1) using respectively the FEDK estimator, the random-effects Mundlak approach and the FGLS estimator.

¹⁶ These are for a given country in the panel dataset, the averages of all time-varying covariates. These 'averages' indicators have the same values for each country, but different values across countries.

5. Interpretation of empirical outcomes

We note that across all columns of Table 1, the interaction term related to the interaction variable "[LDC*DFQF]" is negative and significant at the 1% level. In addition, the results concerning the interaction variable "[LDC*DFQF]" in columns [1] and [2] are identical. As noted in the previous section, one advantage of the random-effects Mundlak approach over the within fixed effects approach is that it allows obtaining the estimates associated with time-invariant covariates such as the "LDC" dummy in model (1). This explains why we have reported the estimates of the variable "LDC" dummy in column [2]. On the basis of these results, we conclude that the DFQF market access initiative has helped reduce the instability of the utilization rate of the DFQF schemes offered to LDCs by QUAD countries. In terms of magnitude of the outcomes reported in columns [1] and [2] (i.e., results based on the FEDK and the Random-effects Mundlak estimators), we obtain that the DFQF market access initiative has led to a fall by 51.9 percent in the degree of the volatility of the utilization of GSP preferences (i.e., DFQF market access schemes) in LDCs over the period 2014-2019 compared to the period 2004-2013. Outcomes based on the FGLS approach (see column [3]) of the Table are slightly different from those in the other columns of the Table. They indicate that thanks to the DFQF market access initiative, the volatility of the utilization rate of DFQF market access schemes in LDCs has decreased respectively by 30.8 per cent. All these findings support our hypothesis set out in section 2.

[Insert Table 1, here]

Concerning control variables, we obtain that across all columns of the Table, the real per capita income and the institutional and governance quality do not affect significantly (at the conventional significance levels) the volatility of the utilization of GSP preferences, while financial development tends to exert a negative and significant effect (at least at the 5% level) on it, especially based on results in columns [1] and [2]. In column [3] (results based on the FGLS estimator), there is no significant effect (at the conventional significance levels) of financial development on the volatility of the utilization of GSP preferences. In columns [1] and [2], we find no significant effect (at least at the 10% level) of development aid on the volatility of the utilization of GSP preferences. However, results based on the FGLS approach show that at least at the 5% level, development aid reduces the volatility of the utilization of GSP preferences.

6. Further analysis

Thus far, the empirical analysis has used the 'country-year' as unit of analysis. The present section extends the previous analysis by using the country-pair/year as unit of analysis. In other words, we rely on UNCTAD's data on the utilization rate (by each country in the treatment and control groups) of GSP programs offered by each QUAD country. Using this dataset and drawing insights from previous works that used country-pair as unit of analysis (e.g., Chowdhury et al. 2021, and Mansfield and Reinhardt, 2008), we augment model (1), notably with the market size and home market effects in the preference-granting countries and with the market size effects in the beneficiary countries, along with an indicator of the overall trade costs experienced by beneficiary countries of GSP programs when exporting to QUAD countries.

On the preference-granting countries' side, the market size is proxied by the real GDP (which denoted "GDPDon") and the wealth is proxied by the real per capita income (denoted "GDPCAPDon"). Note that for the European Union (as a single preference-granting country), we have computed the average of these variables. On the beneficiary countries' side, the wealth is proxied by the real per capita income, which we denoted "GDP" in model (1), and the market size is proxied by the real GDP, denoted "GDPCAP". We additionally control for the prevailing political and economic uncertainties in the donor-country (denoted "WUIDon"). The uncertainty indicator is collected from Ahir et al. (2018), and represents the frequency of the word 'uncertainty' (and its variant) in the Economist Intelligence Unit (EIU) country reports. We expect that a higher uncertainty in donor-countries may lead donors to revise 'unfavourably' the conditions for eligibility to GSP programs, notably for developing countries that are not LDCs¹⁷. This eventual unfavourable revision of conditions for eligibility to the GSP programs could lead to a higher volatility of the utilization of these preferences for developing countries that are not LDCs. Likewise, it is also possible that higher economic and political uncertainties in preference-granting countries may result in a reduction in the demand for foreign products (including those supplied by beneficiaries of GSP programs), and hence lead to greater fluctuations of the utilization rates of GSP programs. At the same time, beneficiaries of GSP programs that have a privileged relationship with donor-countries may not suffer for an increase in the volatility of the utilization of their trade preference programmes during high economic and political uncertainties in the donor-countries.

¹⁷ Preferences to LDCs are usually protected even during hard times because preference-granting countries, including developed countries, try to meet their obligations as provided for by the Decisions concerning the DFQF market access for LDCs.

The new model specification, therefore, takes the following form:

$$\begin{aligned}
 URGSPVOL_{ijt} = & \delta_0 + \delta_1[(LDC_i) * (DFQF_t)] + \delta_2LDC_i + \delta_3DFQF_t + \delta_4Log(TRCOST)_{ijt-3} + \\
 & \delta_5Log(ODA)_{it-3} + \delta_6Log(GDPCAP)_{it-3} + \delta_7Log(GDP)_{it-3} + \delta_8INST_{it-3} + \delta_9FINDEV_{it-3} + \\
 & \delta_{10}WUIDon_{jt} + \delta_{11}Log(GDPCAPDon)_{it} + \delta_{12}Log(GDPDon)_{it} + \vartheta_{ij} + \epsilon_{ijt} \quad (2)
 \end{aligned}$$

As defined above, the subscript i refers to a beneficiary country of the GSP programs (including the DFQF market access schemes for LDCs, and less generous preferential treatment under the GSP programs for other LICs) provided by QUAD countries. t indicates a given year. The subscript j refers to a given QUAD country (or entity), that is, Canada, the European Union (as an entity), Japan or the United States. δ_0 to δ_{12} are new parameters to be estimated. ϑ_{ij} are country-pair effects, and ϵ_{ijt} is a well-behaving error term. All variables contained in model (2) are defined in Appendix 1. Statistics reported in Appendices 3a to 3b are valid here as well. We have reported the descriptive statistics related to the additional variables in Appendix 4 (both for the full sample, as well as the treatment and control groups).

The variable "URGSPVOL" is the volatility of the utilization rate of GSP programs, and is as defined above (including as transformed above). However, it is defined here at the country-pair level rather than at a country-year level. Our coefficient of interest is δ_1 .

The variable "TRCOST" is the indicator of overall trade costs defined at the country-pair level. It represents the overall trade costs experienced by a given beneficiary country of GSP programs when exporting to the market of a QUAD country. Trade costs are considered here in a larger sense (that of Anderson and van Wincoop, 2004) and include not only tariffs and international transport costs, but also other trade cost components discussed in Anderson and van Wincoop (2004), such as direct and indirect costs associated with differences in languages, currencies as well as cumbersome import or export procedures. Higher values of the indicator of the overall trade costs indicate higher overall trade costs. This index is computed by Arvis et al. (2012, 2016) following the approach proposed by Novy (2013). We expect countries facing higher trade costs to experience a greater volatility of the utilization of GSP programs than countries experiencing lower trade costs.

We use the three estimators described above to estimate model (2) with and without the indicator of trade costs, and where standard errors of estimates are clustered at the country-pair levels to obtain robust estimates. This is because as it would be observed later, the introduction of the indicator of trade costs in model (2) leads to the loss of many observations. Table 2 contains

results of the estimation of model (1) without the indicator of trade costs, while Table 3 reports the outcomes stemming from the estimation of model (1) with the indicator of trade costs.

[Insert Table 2, here]

We note that the coefficients of the interaction variable "LDC*DFQF" in the three columns of Table 2 are all negative and significant at the 1% level. While these coefficients are yet not identical but closed in terms of magnitude in columns [1] and [2] of the Table, they are far lower (in terms of magnitude) than the one in column [3] of the same Table (results based on the FGLS estimator). Summing-up, the outcomes support our theoretical hypothesis, and suggest that the LDC DFQF market access schemes have been instrumental in reducing the volatility of the utilization rates of GSP programs. The implementation of DFQF market access schemes has resulted in a decline in LDCs' volatility of utilization of DFQF schemes by 23.8 per cent and 25.6 per cent, respectively for results in column [1] (based on the FEDK estimator) and in column [2] (results based on the Mundlak approach). For the results-based on the FGLS approach, LDCs' volatility of the utilization of DFQF market access schemes declined by 9.93 per cent (over the period from 2014 to 2019 compared to the period from 2004 to 2013) thanks to the DFQF market access schemes.

Concerning control variables on the beneficiary countries' side, we find that at the 5% level, development aid and the institutional and governance quality do not affect significantly the volatility of the utilization of GSP programs. At the 5% level, the real per capita income exerts a positive and significant effect only in column [1], as in the other columns, the effect is not significant. Similarly, in columns [1] and [2], there is (at the 5% level) no significant effect of financial development on the volatility of the utilization of GSP programs. In contrast, in column [3], financial development appears to influence negatively and significantly (at the 1% level) the volatility of the utilization of GSP programs. Meanwhile, we obtain across the three columns of the Table that countries with large domestic market size tend to experience a lower volatility of the utilization of GSP preferences than countries with a relatively lower domestic market size. This may reflect a higher dependence on trade, and hence on non-reciprocal trade preferences, of countries with a small domestic market size compared to countries with a relatively larger domestic market size.

As for control variables on the side of preference-granting countries, we find that the outcomes are not consistent across the three columns of the Table. At the 5% level, greater economic and political uncertainties lead to a lower volatility of the utilization of GSP preferences (see results in column [2]), and the increase in the market access size is associated with a higher volatility of the utilization of GSP programs by beneficiary countries. The latter outcome may

indicate that as their market size increases, preference-granting countries trade (i.e., export) less, which may result in a higher volatility of the utilization of GSP programs. Incidentally, there is no significant effect of countries' wealth on the volatility of the utilization of GSP programs.

[Insert Table 3, here]

We now turn to results reported in Table 3. It is important to underline at the outset that the outcomes concerning control variables in this Table are quite similar to those in Table 2. In addition, results based on the FGLS estimator (see column [3]) reveal as expected that higher trade costs are positively and significantly (at the 1% level) associated with an increase in the volatility of the utilization of GSP programs. However, there is no significant effect (at the conventional significance levels) of trade costs on the volatility of the utilization of GSP programs in columns [1] and [2]. Concerning our key variable of interest, namely the interaction variable "LDC*DFQF", we find from the three columns of Table 3 that the coefficients of this variable are all negative and significant at least at the 5% level (the coefficient is significant at the 5% level in column [1] - results based on the FEDK estimator-, but at the 1% level in columns [2] and [3]). Once again, these findings lend support to our theoretical hypothesis, and lead us to conclude that the DFQF market access initiative have helped mitigate the volatility of the utilization rates of these schemes. In terms of magnitude of the effects, the DFQF market access initiative has led to a decrease of LDCs' volatility of the utilization of DFQF schemes by 20.9 per cent (see column [1]), 22.4 per cent (see column [2]) and 10.1 per cent (see column [3]).

7. Conclusion

WTO Members have provided many flexibilities in WTO Agreements, and adopted several measures to promote the integration of LDCs into the global trading system. One major Decision requests that WTO developed country Members, and WTO developing country Members that are in the position to do so, provide DFQF market access to at least 97% of products originating from LDCs, as long as beneficiary countries preserve the LDC status. Some previous studies have shown that the DFQF market access initiative has been instrumental in promoting LDCs' exports to preference-granting countries. The present paper has complemented these studies by investigating whether the DFQF market access initiative has helped LDCs reduce the volatility of the utilization of DFQF market access schemes. The hypothesis tested is that the minimum target of '97%' as contained in the relevant ministerial Decisions, along with the unlimited duration of the DFQF market access schemes would improve the predictability of market access for trading firms in beneficiary countries, and reduce the volatility of the utilization rate of these preference schemes.

The analysis has used the difference-in-difference approach to explore how LDCs have performed in terms of the volatility of the utilization rate of DFQF market access schemes compared to the volatility of the utilization of GSP programs by other LICs (designated as such by the IMF), notably over the period 2014-2019 versus the period 2004-2013. These 'other LICs' have not benefited from the DFQF market access initiative

The analysis has provided support for this hypothesis by showing that the DFQF market access initiative has genuinely been instrumental in reducing the volatility of the utilization rate of these generous preferences schemes in LDCs. This finding indicates that the DFQF schemes play a valuable role in stabilizing LDCs' exports to preference-granting countries. It, therefore, ensues that countries that will graduate from the LDC category may face an instability of their export revenue unless appropriate measures are taken by preference-granting countries to avoid a fall back of graduating countries into the LDC category in a near future.

References

- Acemoglu, D., Johnson, S., Robinson, J., and Taicharoen, Y. (2003). Institutional causes, macroeconomic symptoms: volatility, crises and growth. *Journal of Monetary Economics*, 50(1), 49-123.
- Agosin, R. (2009). Export Diversification and Growth in Emerging Economies. *Cepal Review*, 97, 115-131.
- Ahir, H., Bloom, N., and Furceri, D. (2018). The World Uncertainty Index. Stanford Mimeo.
- Anderson, J. E. and Marcouiller, D. (2002). Insecurity and the pattern of trade: an empirical investigation. *Review of Economics and Statistics*, 84(2), 342-352.
- Araujo, B., Combes, J-L., and Combes, P.M. (1999). The Economic Consequences of Export Instability in Developing Countries: A Survey. Working Papers 199926, CERDI, Clermont-Ferrand, France.
- Arvis, J-F., Duval, Y., Shepherd, B., and Utoktham, C. (2012), Trade Costs in the Developing World: 1995-2010. ARTNeT Working Papers, No. 121/December 2012 (AWP No. 121). Asia-Pacific Research and Training Network on Trade, Bangkok, ESCAP.
- Arvis, J., Duval, Y., Shepherd, B., Utoktham, C., and Raj, A. (2016). Trade Costs in the Developing World: 1996-2010. *World Trade Review*, 15(3), 451-474.
- Athukorola, P. C. (2000). Manufacturing exports and terms of trade of developing countries: evidence from Sri Lanka. *Journal of Development Studies*, 36, 89-104.
- Auboin, M. (2009). Restoring trade finance during a period of financial crisis: stock-taking of recent initiatives. WTO Staff Working Paper, ERSD-2009-16. World Trade Organization (WTO), Geneva, Switzerland.
- Auboin, M. (2021). Trade finance, gaps and the covid-19 pandemic: a review of events and policy responses to date. WTO Staff Working Paper, ERSD-2021-5. World Trade Organization (WTO), Geneva, Switzerland.
- Bai, J., Choi, S.H., and Liao, Y. (2021). Feasible generalized least squares for panel data with cross-sectional and serial correlations. *Empirical Economics*, 60, 309-326.
- Bartels, L., and Häberli, C. (2010). Binding Tariff Preferences for Developing Countries under Article II GATT. *Journal of International Economic Law*, 13(4), 969-995.
- Bayraktar, N. (2019). Effectiveness of public investment on growth in Sub-Saharan Africa. *Eurasian Economic Review*, 9, 421-457.
- Bekaert, G., Harvey, C.R. and Lundblad, C. (2006). Growth Volatility and Financial Liberalization. *Journal of International Money and Finance*, 25(3), 370-403.
- Bems, R., Johnson, R.C., and Yi, K-M. (2013). The Great Trade Collapse. *Annual Review of Economics*, 5(1), 375-400.

Binici, M., and Ganioglu, A. (2021). Net external position, financial development, and banking crisis. *Empirical Economics*, 61, 1225-1251.

Bleaney, M., and Greenaway, D. (2001). The Impact of Terms of Trade and Real Exchange Volatility on Investment and Growth in Sub-Saharan Africa. *Journal of Development Economics*, 65, 491-500.

Borchert, I. and Di Ubaldo, M. (2020). Go ahead and trade: the effect of uncertainty removal in the EU's GSP scheme. EUI Working Paper RSCAS 2020/15. European University Institute, Italy.

Bouët, A., Debucquet, D.L., and Dienesch, E. (2010). The Costs and Benefits of Duty-Free, Quota-Free Market Access for Poor Countries: Who and What Matters – CDG Working Paper 206. Center for Global Development, Washington, D.C.

Brenton, P. (2003). Integrating the Least Developed Countries into the World Trading System: The Current Impact of European Union Preferences Under “Everything But Arms”. *Journal of World Trade*, 37(3), 623-646.

Brenton, P., and Ikezuki, T. (2005). 'The impact of agricultural trade preferences, with particular attention to the least developed countries'. Chapter 4, In *Global agricultural trade and developing countries* / editor M. Ataman Aksoy, John C. Beghin. Page 55-73. – (Trade and development).

Caldera Sánchez, A. and Röhn, O. (2016). How do policies influence GDP tail risks? OECD Economics Department Working Papers ECO/WKP (2016) 63, OECD Publishing, Paris.

Cariolle, J. (2013). Export instability, corruption, and how the former influences the latter. PhD Thesis, Université d'Auvergne, Clermont-Ferrand 1, Clermont-Ferrand. Retrieved from <https://tel.archives-ouvertes.fr/tel-00828174/document>

Cariolle, J. (2013). Export instability, corruption, and how the former influences the latter. PhD Thesis, Université d'Auvergne, Clermont-Ferrand 1, Clermont-Ferrand. Retrieved from <https://tel.archives-ouvertes.fr/tel-00828174/document>

Chowdhury, A., Liu, X., Wang, M., and Wong, M. (2021). The Role of Multilateralism of the WTO in International Trade Stability. *World Trade Review*, 20(5), 668-689.

Collier, P., and Venables, A. J. (2007). Rethinking Trade Preferences: How Africa Can Diversify its Exports. *The World Economy*, 30(8), 1326-1345.

Compa, L., and Vogt, J. (2005). Labor Rights in the Generalized System of Preferences: A 20-year Review. *Comparative Labor Law & Policy Journal*, 22, 199-238.

Dawe, D. (1996). A new look at the effects of export instability on investment and growth. *World Development*, 24, 1905-14.

Dowlah, C. (2008). The generalized system of preferences of the United States: Does it promote industrialization and economic growth in least developed countries? *The Law and Development Review*, 1(1), 71-96.

Driscoll, J. C., and Kraay, A.C. (1998). Consistent Covariance Matrix Estimation with Spatially Dependent Panel Data. *Review of Economics and Statistics*, 80(4), 549-560.

Ebeke, C., and Ehrhart, H. (2012). Tax Revenue Instability in Sub-Saharan Africa: Consequence and Remedies. *Journal of African Economies*, 21(1), 1-27.

Ghosh, A. R., and Ostry, J. (1994). Export Instability and the External Balance in Developing Countries. *IMF Staff Papers*, 41, 214-235. International Monetary Fund, Washington, D.C.

Gnangnon, S.K. (2018). Impact of multilateral trade liberalization and aid for trade for productive capacity building on export revenue instability. *Economic Analysis and Policy*, 58, 141-152.

Gnangnon, S.K. (2021). Tariff Volatility and Tariff Policy in Developed and Developing Countries. *Asian Development Perspectives*, 12(2), 101-131.

Gnangnon, S.K. (2022). Development Aid and Export Resilience in Developing Countries: A Reference to Aid for Trade. Accepted and forthcoming in "Economics", 2022.

Gnangnon, S.K., and Priyadarshi, S. (2017). The multilateral decision on duty free quota free market access and least developed countries' export performance. *Economic Analysis and Policy*, 56, 86-100.

Gnutzmann-Mkrtchyan, A., and Volmer, M. (2022). EU trade policy reform: towards reciprocal concessions with developing countries. *Hannover Economic Papers (HEP) dp-697*, Leibniz Universität Hannover, Wirtschaftswissenschaftliche Fakultät.

Gradeva, K., and Martínez-Zarzoso, I. (2016). Are Trade Preferences more Effective than Aid in Supporting Exports? Evidence from the 'Everything But Arms' Preference Scheme. *The World Economy*, 39(8), 1146-1171.

Grossman, G. M., and Sykes, A.O. (2005). A preference for development: the law and economics of GSP. *World Trade Review*, 4(1), 41-67.

Hakobyan, S (2017). Export competitiveness of developing countries and US trade policy. *The World Economy*, 40(7), 1405-1429.

Hakobyan, S. (2020). GSP expiration and declining exports from developing countries. *Canadian Journal of Economics*, 53(3), 1132-1161.

Han, Y. (2021). Three Essays on Export Earnings Volatility. PhD Thesis, University of Kentucky. Retrieved from <https://doi.org/10.13023/etd.2021.297>

Herz, B., and Wagner, M. (2011). The Dark Side of the Generalized System of Preferences. *Review of International Economics*, 19(4), 763-775.

Hesse, H. (2008). Export Diversification and Economic Growth", Working Paper No. 21, Commission on Growth and Development, World Bank, Washington, D.C.

Hirsch, S., and Lev, B. (1971). Sales stabilization through export diversification. *The Review of Economics and Statistics*, 53(3), 270-277.

Hoekman, B., and Özden, C. (2006). Trade Preferences and Differential Treatment of Developing countries. Critical Perspectives on the Global Trading System and the WTO series. Edited by Bernard Hoekman, European University Institute, Italy and Çağlar Özden, The World Bank, Washington, D.C.

IMF (2021). Macroeconomic Developments and Prospects In Low-Income Countries -2021. IMF Policy Paper, International Monetary Fund, Washington, D.C. Retrieved from <https://www.imf.org/en/Publications/Policy-Papers/Issues/2021/03/30/Macroeconomic-Developments-and-Prospects-In-Low-Income-Countries-2021-50312>

Ito, T., and Aoyagi, T. (2019). Did the least developed countries benefit from duty-free quota-free access to the Japanese market? *Japan and the World Economy*, 49, 32-39.

Juvenal, L., and Monteiro, P. (2013). Export Market Diversification and Productivity Improvement: Theory and Evidence from Argentinian Firms. Federal Reserve Bank of Saint Louis, Working Paper 2013-015A.

Kaufmann, D., Kraay, A. and Mastruzzi, M. (2010). The Worldwide Governance Indicators Methodology and Analytical Issues. World Bank Policy Research N° 5430 (WPS5430). The World Bank, Washington, D.C.

Klasen, S., Martínez-Zarzoso, I., Nowak-Lehmann, F., and Bruckner, M. (2021). Does the designation of least developed country status promote exports? *The Journal of International Trade & Economic Development*, 30(2), 157-177.

Kramarz, F., Martin, J., and Mejean, I. (2020). Volatility in the small and in the large: The lack of diversification in international trade. *Journal of International Economics*, Vol 122, Article 103276.

Low, P., Piermartini, R., and Richter, J. (2009). Multilateral Solutions to the Erosion of Nonreciprocal Preferences in Nonagricultural Market Access. In: "Trade Preference Erosion: Measurement and Policy Response", Edited by Hoekman, B., Martin, W., and Braga, C.A.P., The World Bank, Washington, D.C.

Mansfield, E. D., and Reinhardt, E. (2008). International institutions and the volatility of international trade. *International Organization*, 62(4), 621-652.

Mathonnat, C., and Minea, A. (2018). Financial development and the occurrence of banking crises. *Journal of Banking & Finance*, 96, 344-354.

Mundlak, Y. (1978). On the pooling of time series and cross section data. *Econometrica*, 46(1), 69-85.

Museru, M., Toerien, F., and Gossel, S. (2014). The impact of aid and public investment volatility on economic growth in sub-Saharan Africa. *World Development*, 57, 138-147.

Novy, D. (2013). Gravity Redux: Measuring International Trade Costs with Panel Data. *Economic Inquiry*, 51(1), 101-121.

Onguglo, B.F. (1999). Developing countries and unilateral trade preferences in the new international trading system. Chapter 4 in Miguel Rodriguez Mendoza, Patrick Low and Barbara

Kotschwar (editors), *Trade Rules in the Making: Challenges in Regional and Multilateral Negotiations*. Washington, D.C.: The Brookings Institution Press/Organization of American States, 1999.

Panagariya, A. (2004). *Aid through Trade: An Effective Option?* International Trade 0308011, University Library of Munich, Germany.

Persson, M. (2015a). From Trade Preferences to Trade Facilitation: Taking Stock of the Issues. *Economics*, 6(1), 2012-17.

Persson, M. (2015b). "Trade Preferences from a Policy Perspective", in O. Morrissey, R. Lopez and K. Sharma (eds.), *Handbook on Trade and Development* (Cheltenham, UK: Edward Elgar), 111-28.

Reynolds, K. M. (2009). The biggest losers (and winners) from US trade liberalization. *The Journal of International Trade & Economic Development*, 18, 421-42.

UNCTAD (2003). *Trade Preferences for LDCs: An Early Assessment of the Benefits and Possible Improvements*. Paper presented at UNCTAD. UNCTAD/ITCD/TSB/2003/8. United Nations Conference on Trade and Development, Geneva, Switzerland.

United Nations (2014). *World Economic Situation and Prospects 2014*. New York: United Nations (2014).

United Nations (2021). *Handbook on the Least Developed Country Category: Inclusion, Graduation and Special Support Measures - Fourth Edition*. Committee for Development Policy and United Nations Department of Economic and Social Affairs, United Nations publication Sales No.: E.22.II.A.1. New York. Retrieved at: <https://www.un.org/development/desa/dpad/wp-content/uploads/sites/45/LDC-Handbook-2021.pdf>

United Nations Conference on Trade and Development (UNCTAD) (2021). *The Least Developed Countries in the post-COVID world: Learning from 50 years of experience. The Least Developed Countries Report 2021*. United Nations, UNCTAD/LDC/2021, New York.

Vannoorenbergh, G., Wang, Z., and Yu, Z. (2016). Volatility and diversification of exports: Firm-level theory and evidence. *European Economic Review*, 89, 216-247.

World Trade Organization (WTO) (2019a). *Utilization rates under preferential trade arrangements for Least Developed Countries under the LDC duty scheme*. Note by the Secretariat for the Committee on Rules of Origin contained in document G/RO/W/185 issued on 9 May 2019. World Trade Organization, Geneva, Switzerland.

World Trade Organization (WTO) (2019b). *Preferential tariff treatment for least developed countries. Decision on extension of waiver, adopted on 16 October 2019 by the General Council, Document WT/L/1069*. World Trade Organization, Geneva, Switzerland.

World Trade Organization (WTO) (2010). *Transparency Mechanism for Preferential Trade Arrangements - General Council Decision of 14 December 2010*. WTO document WT/L/806, World Trade Organization, Geneva Switzerland.

World Trade Organization (WTO) (2016). Modalities for the calculation of "Preference Utilization". Note by the Secretariat for the Committee on Rules of Origin, document G/RO/W/161. World Trade Organization, Geneva, Switzerland.

World Trade Organization (WTO) (2022). Boosting trade opportunities for least-developed countries - Progress over the past ten years and current priorities. Geneva, Switzerland. Accessible online at: https://www.wto.org/english/res_e/publications_e/boottradeopp22_e.htm

World Trade Organization (WTO) (2005). Ministerial Declaration on Doha Work Programme. Adopted on 18 December 2005 at the Sixth Session of Trade Ministers Conference (document, WT/MIN(05)/DEC). Hong Kong, China, December 13-18.

World Trade Organization (WTO) (2013). Duty-Free and Quota-Free (DFQF) market access for Least Developed Countries. Decision adopted on 7 December 2013 at the Ninth Session of the Ministerial Conference document, WT/MIN(13)/44). Bali, Indonesia, 3-6 December 2013.

World Trade Organization (WTO) (2015). Preferential rules of origin for least developed countries. Decision adopted on 19 December 2015 at the Tenth Session of the Ministerial Conference document, WT/MIN(15)/47). Nairobi, Kenya, 15-18 December 2015.

World Trade Organization (WTO) (2021a). Market access for products and services of export interest to least developed countries. Note by the Secretariat prepared for the Sub-Committee on Least Developed Countries, WT/COMTD/LDC/W/69, 27 October 2021. World Trade Organization, Geneva, Switzerland.

World Trade Organization (WTO) (2021b). Participation of developing economies in the global trading system. Note by the Secretariat prepared for the Committee on Trade and Development, WT/COMTD/W/262, 28 October 2021. World Trade Organization, Geneva, Switzerland.

World Trade Organization (WTO) (2021c). Special And Differential Treatment Provisions in WTO Agreements and Decisions. Note by the Secretariat prepared for the Committee on Trade and Development, WT/COMTD/W/258, 2 March 2021. World Trade Organization, Geneva, Switzerland.

Yeyati, E. L., Panizza U, and Stein, E (2007). The cyclical nature of North-South FDI flows. *Journal of International Money and Finance*, 26, 104-130.

Zellner, A. (1962). An efficient method of estimating seemingly unrelated regressions and tests for aggregation bias. *Journal of the American statistical Association*, 57(298), 348-368.

FIGURE

Figure 1: Development of the volatility of the utilization rate of GSP programs in the LDCs and other LICs (designated as such by the IMF)



Source: Author

Note: The variable "URGSPVOL" is the transformed indicator of the volatility of the utilization rate of GSP programs.

Table 1: Effect of the LDC Services Waiver on the volatility of the utilization rate of GSP programs in LDCs compared to other LICs

Estimators: FEDK, Random-effects Mundlak and FGLS with panel-specific AR1 autocorrelation structure

Variables	FEDK	Random-effects Mundlak	FGLS
	URGSPVOL	URGSPVOL	URGSPVOL
	(1)	(2)	(3)
DFQF*LDC	-0.519*** (0.138)	-0.519*** (0.124)	-0.308*** (0.0914)
DFQF	0.189 (0.120)	0.189* (0.108)	-0.216** (0.108)
LDC		-0.676 (0.617)	0.108 (0.100)
Log(ODA) _{t-3}	0.00610 (0.0839)	0.00610 (0.0769)	-0.0606** (0.0244)
Log(GDPCAP) _{t-3}	0.127 (0.587)	0.127 (0.363)	-0.0692 (0.0668)
INST _{t-3}	0.0138 (0.0657)	0.0138 (0.106)	0.0150 (0.0271)
FINDEV _{t-3}	-0.0185** (0.00857)	-0.0185*** (0.00516)	-0.000757 (0.00222)
Constant	0.159 (4.537)	7.555*** (2.035)	2.481*** (0.793)
Observations - Countries	732 - 61	732 - 61	732 - 61
Within R ²	0.0728	0.0728	
Between R ²		0.2022	
Overall R ²		0.0993	
Pseudo R ²			0.3502

Note: *p-value<0.1; **p-value<0.05; ***p-value<0.01. Robust Standard Errors are in parenthesis. The full sample contains both the control group (i.e., 21 countries) and the treated group (i.e., 40 LDCs). The dummy variable "DFQF" takes the value 1 after the year 2013, i.e., from 2014, and 0 for the other years. The dummy "DFQF" takes the value of 1 from 2014 to 2019, and the dummy "LDC", the latter taking 1 for LDCs, and 0, for countries in the control group. The Pseudo R2 has been calculated for FGLS-based regressions, as the correlation coefficient between the dependent variable and its predicted values. Time dummies have been included in the FGLS-based regressions.

Table 2: Effect of the LDC Services Waiver on the volatility of the utilization rate of GSP programs in LDCs compared to other LICs

Estimators: FEDK, Random-effects Mundlak and FGLS with panel-specific AR1 autocorrelation structure

Variables	FEDK	Random-effects Mundlak	FGLS
	URGSPVOL	URGSPVOL	URGSPVOL
	(1)	(2)	(3)
DFQF*LDC	-0.238*** (0.0903)	-0.256*** (0.0785)	-0.0993*** (0.0360)
DFQF	0.232*** (0.0552)	0.282*** (0.0825)	0.0782 (0.0541)
LDC		0.142 (0.224)	0.0342 (0.0496)
Log(ODA) _{t-3}	0.0434 (0.0402)	0.0489 (0.0491)	0.0182 (0.0142)
Log(GDPCAP) _{t-3}	1.089*** (0.339)	0.932* (0.501)	0.0269 (0.0305)
Log(GDP) _{t-3}	-1.292*** (0.293)	-1.056*** (0.372)	-0.130*** (0.0156)
INST _{t-3}	0.0552* (0.0293)	0.0607 (0.0642)	-0.00375 (0.0140)
FINDEV _{t-3}	-0.00257* (0.00152)	-0.00184 (0.00327)	-0.00397*** (0.00101)
WUIDon	-0.669* (0.357)	-0.476** (0.206)	-0.0147 (0.0779)
Log(GDPCAPDon)	-4.273 (2.653)	-0.334 (0.804)	-0.0483 (0.0759)
Log(GDPDon)	3.799* (2.199)	0.0657 (0.0604)	0.0532*** (0.0171)
Constant	-45.64 (38.52)	1.555 (3.425)	1.934* (1.003)
Observations - Countries	2,007 - 204	2,007 - 204	2,004 - 201
Within R ²	0.0346	0.0286	
Between R ²		0.0666	
Overall R ²		0.0499	
Pseudo R ²			0.1959

Note: **p*-value<0.1; ***p*-value<0.05; ****p*-value<0.01. Standard errors are clustered at the country-pair level, and robust standard errors are reported in parenthesis. The full sample contains both the control group (i.e., 21 countries) and the treatment group (i.e., 40 LDCs). The dummy variable "DFQF" takes the value 1 after the year 2013, i.e., from 2014, and 0 for the other years. The dummy "DFQF" takes the value of 1 from 2014 to 2019, and the dummy "LDC", the latter taking 1 for LDCs, and 0, for countries in the control group. The Pseudo R2 has been calculated for FGLS-based regressions, as the correlation coefficient between the dependent variable and its predicted values. Time dummies have been included in the FGLS-based regressions.

Table 3: Effect of the LDC Services Waiver on the volatility of the utilization rate of GSP programs in LDCs compared to other LICs

Estimators: FEDK, Random-effects Mundlak and FGLS with panel-specific AR1 autocorrelation structure

Variables	FEDK	Random-effects Mundlak	FGLS
	URGSPVOL	URGSPVOL	URGSPVOL
	(1)	(2)	(3)
DFQF*LDC	-0.209** (0.0861)	-0.224*** (0.0821)	-0.101*** (0.0353)
DFQF	0.223*** (0.0580)	0.268*** (0.0853)	0.106* (0.0562)
LDC		0.162 (0.222)	0.0181 (0.0565)
Log(TRCOST) _{t-3}	0.115 (0.118)	0.0737 (0.160)	0.169*** (0.0436)
Log(ODA) _{t-3}	0.0477 (0.0502)	0.0535 (0.0524)	0.0271* (0.0139)
Log(GDPCAP) _{t-3}	0.940** (0.373)	0.836 (0.556)	0.0310 (0.0440)
Log(GDP) _{t-3}	-1.247*** (0.279)	-1.034*** (0.396)	-0.104*** (0.0193)
INST _{t-3}	0.0467 (0.0334)	0.0494 (0.0675)	0.00580 (0.0167)
FINDEV _{t-3}	-0.00105 (0.00168)	-0.000367 (0.00352)	-0.00240** (0.00109)
WUIDon	-0.684** (0.331)	-0.488** (0.219)	-0.0764 (0.0812)
Log(GDPCAPDon)	-4.018 (2.575)	-0.0324 (0.861)	-0.131 (0.0891)
Log(GDPDon)	3.840* (2.110)	0.0687 (0.0632)	0.0186 (0.0190)
Constant	-50.13 (36.51)	-3.286 (4.502)	2.101 (1.353)
Observations - Countries	1,841 - 188	1,841 - 188	1,839 - 186
Within R ²	0.03	0.0240	
Between R ²		0.0838	
Overall R ²		0.0513	
Pseudo R ²			0.2003

Note: *p-value<0.1; **p-value<0.05; ***p-value<0.01. Standard errors are clustered at the country-pair level, and robust standard errors are reported in parenthesis. The full sample contains both the control group (i.e., 21 countries) and the treatment group (i.e., 40 LDCs). The dummy variable "DFQF" takes the value 1 after the year 2013, i.e., from 2014, and 0 for the other years. The dummy "DFQF" takes the value of 1 from 2014 to 2019, and the dummy "LDC", the latter taking 1 for LDCs, and 0, for countries in the control group. The Pseudo R2 has been calculated for FGLS-based regressions, as the correlation coefficient between the dependent variable and its predicted values. Time dummies have been included in the FGLS-based regressions.

Appendix 1: Definition and Source of variables

Variables	Definition	Source
URGSPVOL	<p>This is the transformed indicator of volatility of the utilization of GSP programs by beneficiary countries. The Generalized System of Preferences (GSP) schemes are unilateral trade preferences provided by the so-called “Quadrilaterals” (i.e., QUAD countries), namely Canada, European Union (EU), Japan and the United States of America (USA). It captures the extent to which imports which are eligible for trade preferences are actually imported under these preferences (e.g., WTO, 2016). The indicator of the utilization of GSP programs by beneficiary countries has been computed using a formula adopted both by the WTO (see WTO, 2016) and the UNCTAD and which goes as follows:</p> $URGSP = 100 * (\text{GSP Received Imports}) / (\text{GSP Covered Imports}),$ <p>where "GSP received imports" refers to the value of imports (by preference-granting countries) that received GSP treatment, and "GSP covered imports" indicates the value of imports (by preference-granting countries), i.e., exports by beneficiary countries that are classified in tariff lines that are dutiable and covered by the GSP scheme of the preference-granting country.</p> <p>Values of the indicator "URGSP" range between 0 and 100, with higher values indicating a greater utilization rate of GSP programs.</p> <p>The initial indicator of the volatility of the utilization rate of GSP programs denoted "URGSPVOL1" has been calculated as the standard deviation over 3-year rolling windows (that is, from t-2 to t) of the growth rate of the utilization rate of GSP programs. Higher values of this indicator reflect greater volatility of the utilization rate of GSP programs.</p> <p>As the indicator "URGSPVOL1" contains many zeros, and is highly skewed, it has been transformed using the approach proposed by Yeyati et al. (2007): $URGSPVOL = \text{sign}(URGSPVOL1) * \log(1 + URGSPVOL1)$, where $URGSPVOL1$ refers to the absolute value of the variable "URGSPVOL1".</p>	<p>Author's calculation based on data on the utilization rates of GSP programs extracted from the United Nations Conference on Trade and Development (UNCTAD) Dataset: https://gsp.unctad.org/utilization</p>

TRCOST	<p>This is the indicator of the comprehensive (overall) trade costs. It is the bilateral overall trade costs on goods (agricultural and manufactured goods) between beneficiaries of the GSP programs, including DFQF schemes and each of the QUAD countries.</p> <p>Data on bilateral overall trade costs has been computed by Arvis et al. (2012, 2016) following the approach proposed by Novy (2013). Arvis et al. (2012, 2016) have built on the definition of trade costs by Anderson and van Wincoop (2004), and considered bilateral comprehensive trade costs as all costs involved in trading goods (agricultural and manufactured goods) internationally with another partner (i.e., bilaterally) relative to those involved in trading goods domestically (i.e., intranationally). Hence, the bilateral comprehensive trade costs indicator captures trade costs in its wider sense, including not only tariffs and international transport costs but also other trade cost components discussed in Anderson and van Wincoop (2004), such as direct and indirect costs associated with differences in languages, currencies as well as cumbersome import or export procedures. Higher values of the indicator of average overall trade costs indicate higher overall trade costs.</p>	<p>Author's computation using the ESCAP-World Bank Trade Cost Database. Accessible online at: https://www.unescap.org/resources/escap-world-bank-trade-cost-database</p> <p>Detailed information on the methodology used to compute the bilateral comprehensive trade costs could be found in Arvis (2011, 2016), as well as in the short explanatory note accessible online at: https://www.unescap.org/sites/default/d8files/Tra de%20Cost%20Database%20-%20User%20note.pdf</p>
GDPCAP	Real per capita Gross Domestic Product (constant 2010 US\$) in the beneficiary countries of GSP programs.	WDI
GDP	Gross Domestic Product (constant 2010 US\$) in the beneficiary countries of GSP programs.	WDI
ODA	This is the real net disbursements of total Official Development Assistance (ODA) that accrue to the beneficiary countries of GSP programs. It is expressed in constant prices 2019, US dollar.	OECD (Organization for Economic Cooperation and Development) database on development indicators.
FINDEV	This is the proxy for financial development in the beneficiary countries of GSP programs. It is measured by the share (%) of domestic credit to private sector by banks in GDP.	WDI
INST	<p>This is the variable capturing the institutional and governance quality in the beneficiary countries of GSP programs. It has been computed by extracting the first principal component (based on factor analysis) of the following six indicators of governance. These indicators are respectively: political stability and absence of violence/terrorism; regulatory quality; rule of law; government effectiveness; voice and accountability, and corruption.</p> <p>Higher values of the index "INST" are associated with better governance and institutional quality, while lower values reflect worse governance and institutional quality.</p>	<p>Data on the components of "INST" variables has been extracted from World Bank Governance Indicators developed by Kaufmann et al. (2010) and updated recently. See online at: https://info.worldbank.org/governance/wgi/</p>

WUIDon	<p>This is the measure of the aggregate world uncertainty index that measures the political and economic uncertainties in a given country. This index has been computed by counting the frequency of the word ‘uncertainty’ (and its variant) in the Economist Intelligence Unit (EIU) country reports (Ahir et al., 2018). The reports of the EIU comment on major economic and political issues in each state and analysis and forecasts on political and economic conditions, created by domestic analysts and the editorial board of the Economist. The indices are normalized by total number of words and rescaled by multiplying by 1,000. A higher number means higher uncertainty and vice versa.</p> <p>The original data is available on a quarterly basis, from 1996 onwards. For the sake of the analysis, we have computed the annual data using for every year, the average of data over the four quarters.</p>	<p>See the database developed by Ahir et al. (2018) and accessible online at: https://worlduncertaintyindex.com/data/</p>
GDPCAPDon	<p>Real per capita Gross Domestic Product in the beneficiary countries (QUAD countries) of GSP programs.</p>	WDI
GDPDon	<p>Real Gross Domestic Product in the preference-granting countries (QUAD countries) of GSP programs.</p>	WDI

Appendix 2: List of the 61 countries used in the full sample, of which the 40 LDCs and 21 countries in the control group_for the analysis concerning the volatility of the utilization of GSP programs

Group treated (LDCs)		Control Group (PRGT-Eligible Low-Income Countries that are not LDCs)
Afghanistan	Malawi	Cabo Verde
Angola	Mali	Cameroon
Bangladesh	Mauritania	Congo, Rep.
Benin	Mozambique	Cote d'Ivoire
Bhutan	Myanmar	Dominica
Burkina Faso	Nepal	Ghana
Burundi	Niger	Grenada
Cambodia	Rwanda	Honduras
Central African Republic	Sao Tome and Principe	Kenya
Chad	Senegal	Kyrgyz Republic
Comoros	Sierra Leone	Maldives
Eritrea	Solomon Islands	Micronesia, Fed. Sts.
Ethiopia	Sudan	Moldova
Gambia, The	Tanzania	Nicaragua
Guinea	Togo	Papua New Guinea
Guinea-Bissau	Uganda	Samoa
Haiti	Vanuatu	St. Vincent and the Grenadines
Lao PDR	Yemen, Rep.	Tajikistan
Lesotho	Zambia	Tonga
Liberia		Uzbekistan
Madagascar		Zimbabwe

Note: The list of PRGT-Eligible Low-Income Countries has been extracted from IMF (2021: p34).

Appendix 3a: Descriptive statistics on variables used in the country-year analytical framework of the volatility of the utilization of GSP programs (see model (1))_ over the full sample

Variable	Observations	Mean	Standard deviation	Minimum	Maximum
URGSPVOL1	732	5.925	61.990	0.000	1531.924
ODA	732	773000000	901000000	5990000	6610000000
GDP	729	1745.304	1694.574	208.075	9226.554
INST	732	-1.476	1.357	-4.457	2.074
FINDEV	711	25.034	18.684	2.170	114.194

Appendix 3b: Descriptive statistics on variables used in the country-year analytical framework of the volatility of the utilization of GSP programs (see model (1))_over the treated Group, i.e., LDCs

Variable	Observations	Mean	Standard deviation	Minimum	Maximum
URGSPVOL1	480	4.557	31.179	0.000	391.607
ODA	480	911000000	993000000	21500000	6610000000
GDP	477	1066.512	712.813	208.075	3843.199
INST	480	-1.787	1.150	-4.457	1.474
FINDEV	462	20.584	16.548	2.398	114.194

Appendix 3c: Descriptive statistics on variables used in the country-year analytical framework of the volatility of the utilization of GSP programs (see model (1))_over the control Group (i.e., other LICs)

Variable	Observations	Mean	Standard deviation	Minimum	Maximum
URGSPVOL1	252	8.531	96.571	0.000	1531.924
ODA	252	509000000	612000000	5990000	3190000000
GDP	252	3030.159	2198.204	669.101	9226.554
INST	252	-0.883	1.518	-3.909	2.074
FINDEV	249	33.292	19.622	2.170	89.184

Appendix 4: Descriptive statistics on variables used in the country-pair/year analytical framework of the volatility of the utilization of GSP programs (see model (2))_over the full sample, the treatment and control groups

Variable	Observations	Mean	Standard deviation	Minimum	Maximum
<i>Over the full sample</i>					
URGSPVOL1	2,007	5.534	49.96	0	1033.79
TRCOST	1,594	285.417	91.284	114.167	749.183
GDPRec	729	17.6	26.4	0.166	210
WUIDon	2,007	0.203	0.095	0.030	0.539
GDPCDon	2,007	40784.480	10558.980	28608.650	60836.770
GDPDon	2,007	10600	6390	1360	20000
<i>Over the treatment group (i.e., LDCs)</i>					
URGSPVOL1	1,359	7.207	60.436	0	1033.79
TRCOST	1,044	286.6356	83.38068	114.571	683.0098
GDPRec	477	19.4	30.2	0.166	210
<i>Over the control group</i>					
URGSPVOL1	648	2.025	7.356	0	82.667
TRCOST	550	283.104	104.700	114.167	749.183
GDPRec	252	14.1	16.7	0.283	82.8

Note: The variables "GDPRec" and "GDPDon" are expressed in billions of US Dollars, constant prices.