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# WTO membership, the membership duration and the utilization of non-reciprocal trade preferences offered by the QUAD Countries

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## Abstract

This article explores the effect of WTO membership and the duration of this membership on the utilization of non-reciprocal trade preferences (NRTPs) offered by the QUAD countries (Canada, European Union, Japan and the United States). It uses an unbalanced dataset of 136 beneficiaries of NRTPs over the period of 2002-2019. Results based on the two-step system generalized method of moments approach have revealed that over the full sample, both the WTO membership and its duration exerts a strong positive effect on the utilization rate of GSP programs and other trade preferences. WTO members have made a better utilization of GSP programs than of other trade preferences. Meanwhile, as the duration of their WTO membership increases, beneficiaries make more use of other trade preferences than of GSP programs. Additionally, WTO membership and its duration exert different effects on the usage of NRTPs across sub-samples, including in least developed countries versus non-least developed countries on the one hand, and in WTO Article XII members versus non-Article XII members, on the other hand. Finally, there exists a non-linear positive effect of the duration of WTO membership on the utilization of both GSP programs and other trade preferences, whereby the positive effect takes place immediately after entry of a country into the WTO, and its magnitude amplifies for every additional year of WTO membership.

**Keywords:** WTO membership; Duration of WTO membership; Utilization of unilateral trade preferences utilization; QUAD countries; Developing Countries.

**Jel Classification:** F1; O19.

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This is a working paper, which represents the personal opinions of individual staff members and is not meant to represent the position or opinions of the WTO or its Members, nor the official position of any staff members. Any errors or omissions are the fault of the author.

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## 1. Introduction

Wealthier economies offer non-reciprocal trade concessions to developing countries with a view to helping them use trade, including exports as tool for promoting economic growth and development. Does the membership in the World Trade Organization (WTO) help to improve the utilization of these preferences by developing countries? The present paper aims to address this question, which has received little attention in the literature.

The WTO<sup>2</sup> celebrated its 25<sup>th</sup> anniversary in 2020, and its relevance for countries and the world economy (as the only global international organization dealing with the rules of trade between nations) has been the subject of an important debate in the international trade law, and economic literature. One issue addressed in the international trade literature is whether the WTO has contributed to expanding trade (export and import) flows, and helped countries improve economic growth and welfare. While the seminal work by Rose (2004) has found no significant effect of GATT<sup>3</sup>/WTO membership on bilateral trade flows, the majority of subsequent studies<sup>4</sup> has shown that such a membership does affect positively trade flows, including both imports and exports. A recent work by Larch et al. (2019) has tried to address the limitation associated with the multilateral nature of GATT/WTO entry in a standard gravity model, by capturing the non-discriminatory nature of GATT/WTO commitments. The authors have investigated the effects of GATT/WTO membership on international trade relative to domestic sales. The work has revealed that, on average, when accounting for the most-favoured-nation (MFN) principle effects of WTO membership, the GATT and/or WTO membership has had larger positive effects than uncovered in previous studies. Especially, joining GATT/WTO has boosted trade among members by 171%, and trade between member and non-member countries by about 88%. Additionally, while both the GATT and the WTO have been effective in promoting trade between members, the WTO has even been more effective in fostering trade with non-members than the GATT. Dutt (2020) has found that then positive effect of WTO membership on trade increases over time, and almost monotonically with years of membership. In particular, in the long term, WTO membership exerts a higher positive effect on trade than the membership of preferential trade agreements. Interestingly, the strongest long term positive trade effect of WTO membership occurs for destinations that are developing countries, and that underwent rigorous accession procedures to join the WTO. Furthermore, the long-term effects of WTO membership dominate bilateral and multilateral PTAs, but fall short of deep integration arrangements.

Beside trade flows, WTO membership can contribute to promoting economic growth and welfare both in countries and in the world (e.g., Andersen et al., 2014; Broto et al., 2021; Fan et al., 2021; Koopman et al., 2020; Tang and Wei, 2009). For example, Tang and Wei (2009) have shown that WTO/GATT accessions encourage domestic investments and promote economic growth, but only for countries that underwent rigorous accession procedures. The improvement

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<sup>2</sup> The WTO was born out of the “Marrakesh Agreement” signed in Marrakesh, Morocco, on April 15, 1994, at the conclusion of the Uruguay Round of Multilateral Trade Negotiations (see information online at: [https://www.wto.org/english/docs\\_e/legal\\_e/04-wto\\_e.htm](https://www.wto.org/english/docs_e/legal_e/04-wto_e.htm))

<sup>3</sup> The GATT is the General Agreement on Tariffs and Trade. It was signed on 30 October 1947, and was the predecessor of the WTO.

<sup>4</sup> These studies include for example, Balding (2010); Chang and Lee (2011); Chemutai and Escaith (2017); Cheong et al. (2014); Eicher and Henn (2011); Grant and Boys (2011); Engelbrecht and Pearce (2007); Helpman et al. (2008); Herz and Wagner (2011a); Kim (2010); Kohl and Trojanowska (2015); Roy (2011); Soukar (2019); Subramanian and Wei (2007); Tomz et al. (2007).

in economic growth performance is sustained during the first five years after accession, and the economy is permanently larger by 20% as a result. Bross et al. (2021) have extended the work of Tang and Wei (2009) to the sample of 32 newly acceded countries to the WTO, and observed that the effect is larger than in Tang and Wei (2009). Specially, five years after accession, an economy is 30% larger, and the positive economic growth impact of the accession lasts more than the first five years. Fan et al. (2021) have shown that China's accession to the WTO has not only benefited to China, but it has also helped to significantly improve global welfare.

The potential role of the WTO in helping to prevent trade wars has also been well emphasized in the literature (e.g., Bekkers and Schroeter, 2020; Hoekman, 2020; Nicita et al., 2018; Koopman et al., 2020; Ossa, 2014).

Cognizant of the critical positive role of trade for economic growth and development, wealthier countries offered unilateral (non-reciprocal) trade preferences (henceforth referred to as NRTPs) to developing countries. This involves the provision by wealthier countries of trade concessions to developing countries without requiring concessions in return (e.g., Persson, 2015a,b). The Resolution<sup>5</sup> 21 (II) adopted by member states at the second conference of the United Nations Conference on Trade and Development (UNCTAD) held in 1968, provided that a “generalized, non-reciprocal, non-discriminatory system of preferences<sup>6</sup> (known also as 'GSP') in favour of the developing countries, including special measures in favour of the least advanced among the developing countries” needed to be established. It also stated that “*such preferences had three objectives: to increase the export earnings of developing countries, to promote their industrialization, and to accelerate their rates of economic growth*” (e.g., Grossman and Sykes, 2005: p 42). In the framework of GSP programs, Least developed countries<sup>7</sup> (LDCs) are offered more generous preferential trade treatments than other developing countries, including in the form of duty free and quota free access<sup>8</sup> to the markets of preference grantors.

The Enabling Clause<sup>9</sup> (established in 1979) is the permanent legal basis for the offer of NRTPs by developed countries to developing ones. Besides GSP programs, wealthier countries could also provide other types of NRTPs to developing countries through a Waiver under the WTO Agreement<sup>10</sup> (see WTO, 2010). This could include the African Growth and Opportunity Act (AGOA) to eligible countries in Sub-Saharan African (SSA) offered by the United States; the non-reciprocal preferential concessions on products originating from the Western Balkans granted

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<sup>5</sup> 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."

<sup>6</sup> These types of preferences are commonly referred to as "Generalized System of Preferences (GSP)".

<sup>7</sup> The category of LDCs contains countries that are the poorest and most vulnerable to environmental and economic shocks in the world (see further information on LDCs online at: <https://www.un.org/ohrrls/content/least-developed-countries>)

<sup>8</sup> See Annex F of the Declaration of Trade Ministers at the Hong Kong Ministerial Conference (WTO, 2005).

<sup>9</sup> The Enabling Clause is also referred to as “Differential and More Favourable Treatment, Reciprocity and Fuller Participation of Developing Countries” (see document accessible at: [https://www.wto.org/english/docs\\_e/legal\\_e/enabling\\_e.pdf](https://www.wto.org/english/docs_e/legal_e/enabling_e.pdf))

<sup>10</sup> NRTPs are referred to as "preferential trade arrangements" (PTA) in the jargon WTO of the WTO. The WTO PTA database provides information on the existing NRTPs (GSP programs and other trade preferences) offered by developed countries to developing countries, as well as the special treatment offered by developing countries to LDCs through a special Waiver under the WTO Agreement. This information is accessible online at: <http://ptadb.wto.org/default.aspx>

by the European Union, and the tariff treatment to products from Commonwealth Caribbean countries offered by Canada.

The present paper examines whether WTO membership and the duration of this membership (i.e., the time elapsed since a country's entry into the WTO) affects the utilization of NRTPs by developing countries. In other words, it investigates empirically whether the WTO membership of developing countries and the duration of this membership helps to better utilize the NRTPs available to them than non-WTO developing members. We may have considered in the analysis only the effect of WTO membership on the utilization of NRTPs. However, addressing only this question (as many studies did as far as the trade effect of GATT/WTO membership is concerned), including merely examine whether years of WTO membership yield, on average, higher (or a lower) utilization rates of NRTPs than years outside the WTO, might not fully reflect the full extent of the effect of being member of the WTO on the utilization of NRTPs. We argue that in addition to being member of the WTO, the duration of such a membership matters (and may even matter more than the mere membership in the WTO) for the utilization of NRTPs by a country. This is because all WTO members did not join the organization the same year, and a country with a low duration of membership might not experience the same effect of this duration on the utilization rate of NRTPs as a long-standing WTO member. The latter has surely more experience (as WTO member) than the former in taking advantage of the benefits of the WTO membership while mitigating its costs.

The analysis makes use of a recent database developed by the UNCTAD on the utilization rates of two main blocks of NRTPs, namely GSP programs and 'other trade preferences' offered to developing countries by the Quadrilaterals (i.e., QUAD countries). The latter are Canada, the European Union, Japan, and the United States. This is, to the best of our knowledge, the most comprehensive dataset that exists on the utilization rate of NRTPs. While the existing studies have examined the trade (imports and exports) effects of WTO membership, works on the effect of WTO membership (and the duration of this membership) on the utilization of NRTPs are rather scant. In addition, the present study builds on the recent work by Gnanon and Iyer (2021), and uses a country-year framework rather than a country-product/year framework<sup>11</sup> to perform the empirical analysis.

The study relies on an unbalanced dataset of 136 beneficiaries of NRTPs (including both WTO members and non-WTO members) over the period 2002-2019. The empirical work has used several econometric estimators, including the pooled ordinary least squares estimator, the within fixed effects estimator, and the two-step system GMM estimator, the latter being the preferred estimator. Results show that both WTO membership and the duration of this membership exerts yet different, but strong positive effects on the utilization rates of GSP programs and other trade preferences. Moreover, the effects of WTO membership and its duration on the utilization rates of GSP programs and other trade preferences vary across sub-samples. Finally, there is a non-linear relationship between the duration of WTO membership and the utilization of GSP programs and other trade preferences, whereby the positive effect of the WTO membership on the usage of these NRTPs takes place immediately after entry of a country at the WTO, and amplifies for every additional year spent as WTO member.

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<sup>11</sup> The majority of previous works on the determinants of the utilization of NRTPs have used a country-product/year framework in their analysis (e.g., Manchin, 2006; Nilsson, 2016; and Sytsma, 2021).

The rest of the article is organized around six sections. Section 2 recalls the benefits of WTO membership. Section 3 builds on Section 2 to discuss how WTO membership and the duration of this membership can affect the utilization rate of NRTPs. Section 4 presents the empirical strategy, and Section 5 interprets estimations' results. Section 6 undertakes a further analysis. Section 7 concludes.

## 2. On the benefits of WTO Membership

In a recent paper, Koopman et al. (2020) have documented the benefits of the multilateral trading system, particularly the WTO, emphasizing that the value of the WTO resides not only in achieving tariff reductions and preventing a global trade war, but also in reducing uncertainty and increasing transparency about trade policy, thereby promoting trade and investment.

WTO membership contributes to trade costs reduction, anchoring tariff reduction, and ensuring stability and predictability of the environment in which firms operate. It helps to overcome "*mercantilist tendencies, embedded in entrenched protectionist lobbying of import-competing industries, potential terms-of-trade gains from tariffs in large countries, and nationalist economic ideologies*" (Jones, 2009: p281). The commitment of each WTO member to tariffs and other trade policy instruments, the reciprocity in trade negotiations, and the orderly dispute settlement provide an external 'anchor' that helps the member to resist domestic protectionist pressures, while also reducing the risk of arbitrary market access barriers or closure that it would otherwise face in the international trade market. This commitment can signal long-term predictability and low credit-risk environments to international investors (Mansfield and Reinhardt, 2008), thereby contributing to reducing the uncertainty of the trading environment (by preventing predatory behaviours) (see also Dutt, 2020). In turn, this encourages firms' innovation, investments in export-oriented production and import sourcing, diversification of export portfolios, and foreign direct investment inflows (Jones, 2009, Koopman et al., 2020; Mansfield and Reinhardt, 2008). For example, according to Coelli (2018) and Liu and Ma (2020), an increase in the uncertainty of the environment in which firms operate discourages firms' innovation. Liu and Ma (2020) have specifically found that by reducing trade policy uncertainty, China's accession to the WTO in 2001 has led to a significant rise in firms' patent application. Nguyen and Piermartini (2018) have provided evidence that Vietnam's accession to WTO has helped reduce significantly uncertainty faced by exporting firms, and has generated higher investment, employment, and productivity. The predictability and stability of WTO market access rules allow new firms to engage in export activities, and helps to reduce prices (e.g., Feng et al., 2017). The predictability and stability of the trading environment are particularly relevant for small and poor countries that would, otherwise, experience serious difficulties to bargain for such broad market access provisions on their own (Jones, 2009; Mattoo and Subramanian, 2004).

The commitment of each WTO Member also acts as guarantees against the reversal of current policies and credibility of future policy and institutions reforms (e.g., Mattoo and Subramanian, 2004). It allows poor countries (especially those with weak institutions) to borrow credibility (e.g., Maggi & Rodriguez-Clare, 1998). Announcements of policy reforms through an international agreement allow *governments to signal to domestic lobbies (opposed to trade opening in order to maintain rents) that the country cannot back down from the commitments made without facing the costs of retaliation, thus creating the domestic environment for reforms to be implemented* (Koopman et al., 2020: p844). Staiger and Tabellini (1999) have found that GATT rules had been instrumental in helping the United

States government make domestic trade policy commitments that it could not have made if these rules did not exist. Keohane (2005: xi) has argued that joining international organizations helps to reduce information asymmetries and ensure that all members benefit from the 'public good' of rules-oriented trade. Dreher and Voigt (2011) have shown that membership in international organizations has a positive effect on member countries' credibility.

The dispute settlement mechanism of the WTO permits to aggrieved countries to protect their rights to foreign markets access and secure their negotiated gains from trade liberalization, by filing costly and time-consuming litigation based on substantial evidence that their products are not enjoying their rights under WTO law (e.g., Balding, 2010; Davey, 2009; Hudec, 1993; Jones, 2009). The dispute resolution mechanism combined with the commitment to a set of trade policy rules enhance policy transparency and facilitate policy convergence among member states, which in turn, help to stabilize trading partners' expectations, and lower trade volatility<sup>12</sup> (e.g., Chowdhury et al., 2021; Maggi, 1999; Mansfield and Reinhardt, 2008). For example, Chowdhury et al. (2021) have established empirically that trade is more stable (i.e., less volatile) between trading partners that are GATT/WTO members than between trading pairs with at least one non-member. Additionally, there is a positive correlation or co-movement of trade volatilities among different trading pairs, although it is much stronger among WTO members than between WTO and non-WTO members. On another note, Cao and Flach (2015) have explored the effect of GATT/WTO membership on world trade prices, and found that GATT/WTO membership reduces the volatility of prices over time for both import and export countries, in particular for members that had undergone rigorous accession procedures.

Koopman et al. (2020) have argued that many of the benefits arising from WTO Membership also accrue to non-members of the WTO. This is because the MFN principle, which is a cornerstone of the multilateral trading system, requires that WTO member countries cannot normally discriminate between their trading partners, that is, between members and non-members. As the nature of some commitments is MFN, countries apply the same tariff rate to member and non-member countries alike. Moreover, the dispute settlement mechanism does not only address the trade problems faced by the complainant, but it also provides better trade opportunities to other WTO members by requiring that the respondent make its measures compliant with WTO rulings (Shin and Ahn, 2019). As a result, the WTO acts as a 'public good' given that WTO membership is non-rival and non-excludable (Koopman et al., 2020).

WTO membership does not bring only benefits. It may also involve adjustment and compliance costs (political, social, and economic) that arise from the trade liberalization and de-regulation process (Jones, 2009). Nonetheless, Drabek and Bacchetta (2004) have shown that while the costs of joining the WTO are not negligible, the benefits that accrue to the joining country are significant, including in terms of improved, greater predictability and stability of market access, improved governance, and the implementation of better economic policies<sup>13</sup> without incurring significant public revenues losses. The costs associated with WTO membership are related to the implementation of the commitments<sup>14</sup> undertaken by a country when joining the WTO, and more

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<sup>12</sup> It is worth noting that Rose (2005) has uncovered empirically that the GATT/WTO membership has not had a significant dampening effect on trade volatility.

<sup>13</sup> Basu (2008) has also reported that WTO membership can help to improve domestic policies.

<sup>14</sup> These can involve the reform or development of the legal and regulatory systems, such as intellectual property protection, customs valuation, and product standards compliance (Jones, 2009).

generally, to the compliance with WTO rules. There are also the adjustment costs related to the liberalization and de-regulation processes, which induce the re-allocation of domestic resources (including the disruption or displacement of local import competing industries) that hurt workers in the context of factor immobility and other market rigidities (e.g., CEPR/World Bank, 2010; de Córdoba et al., 2006; Kim and Pelc, 2021). These costs induce significant expenditure for governments, and consequently a significant external assistance<sup>15</sup> (for example in the form of development aid) for developing countries, in particular poor countries that have deficient internal adjustment mechanisms and concurrently limited financial resources<sup>16</sup> (e.g., Jones, 2009; Prowse, 2006). This is where Aid for Trade (AfT)<sup>17</sup> flows come in (e.g., Hoekman, 2011; Prowse, 2006; Rodrik, 2005). The 'AfT' concept has emerged from the recognition by WTO Members that liberalizing trade regimes alone is not sufficient to help poor countries harness trade opportunities, and the provision of technical assistance might not be a sufficient response to concerns about adjustment and implementation costs of trade agreements (e.g., Hoekman, 2011). Hence, the need to provide higher AfT flows (as part of the overall official development assistance) to developing countries, including poorest countries among them. Using data covering the period 2001-2010, Lee et al. (2015) have examined whether WTO developing members (notably LDC members) receive more AfT flows than developing countries that are not members of the WTO. Their findings indicate that compared to non-WTO developing members, WTO developing members received 24.1 percent more AfT dollar commitments and a 43.3 percent greater number of AfT projects. Especially, LDC WTO members received, on average, more AfT than non-WTO LDCs, although this difference has not increased since the AfT initiative was launched. This finding highlights a strong benefit in terms of AfT for WTO developing members compared to non-WTO developing members.

In addition, developing countries enjoy many flexibilities (also referred to special and differential - S&D - treatment) to implement WTO Agreements and foster their integration into the global trading system, and LDCs even enjoy more generous flexibilities (e.g., Hoekman, 2005a; Keck and Low, 2004; Low, 2021; Ukpe Khorana, 2021; United Nations, 2018, Chapter2; WTO, 2021; WTO/EIF, 2020). These flexibilities include the longer time periods for implementing Agreements and commitments; measures to increase trading opportunities for developing countries; provisions requiring all WTO members to safeguard the trade interests of developing countries; support to help developing countries build the capacity to carry out WTO work, handle disputes, and implement technical standards; and provisions related to LDC members (see WTO, 2021).

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<sup>15</sup> The external assistance could also take the form of preferential access provided by high-income countries to developing countries, notably the poorest among them (Hoekman, 2011).

<sup>16</sup> According to Finger and Schuler (2000), the burden of implementation costs of WTO disciplines may fall disproportionately heavily upon poorer countries.

<sup>17</sup> The AfT Initiative was launched in 2005 by WTO Members at the WTO Hong Kong Ministerial Conference (see Paragraph 57 of the Declaration of this Ministerial Conference - see WTO, 2005).



### **3. Discussion on the effect of WTO membership and its duration on the utilization of NRTPs**

The key issue here is how being a WTO developing member (compared to a non-WTO developing member) could affect the utilization of NRTPs. More importantly, we are interested in how, for a given country, the duration of WTO Membership (i.e., the elapse time since it becomes a WTO member) could affect its usage rates of NRTPs. The first sub-section discusses the effect of WTO membership on the utilization of NRTPs, and the second sub-section explores theoretically possible avenues through which the duration of WTO membership can affect the utilization of NRTPs.

#### ***3.1. Effect of WTO membership on the utilization of NRTPs***

Our main argument is that in light of the potential benefits of WTO membership highlighted above, WTO developing members could enjoy a higher utilization of NRTPs than non-WTO developing members, including through *inter alia*, the implementation of better economic policies, the improvement of the institutional and governance quality, and the entitlement of higher AfT flows (compared to non-WTO members) that help strengthen their trade capacity and competitiveness in the international trade market. It is noteworthy that given the potential overlap among the various NRTPs available to a beneficiary country, the latter may, for some reasons, opt for utilizing some NRTPs at the expense of others (e.g., Gnanon and Iyer, 2021; Hakobyan, 2015; Keck and Lendle, 2012). As a result, WTO membership may positively affect the usage of NRTPs available to a country, or it could also lead the latter to make a better utilization of some NRTPs than (or at the expense of) other NRTPs.

The possible higher positive effects of domestic policy reforms on the utilization rate of NRTPs by WTO members compared to non-WTO members could be explained by the fact that while non-WTO members could undertake unilateral trade policy reforms (including trade policy liberalization) on their own (i.e., without any external pressure), they are subject to greater domestic protectionism by import-competing industries than WTO members. Thus, the risk of policy reversals and the weak credibility of commitment to future policy reforms are likely much stronger for non-WTO members than for WTO members. These could result in a greater uncertainty for the business community, discourage innovation by firms and their investment in trade-related activities, reduce foreign direct investment inflows, and ultimately lead to a lower utilization of NRTPs. Many works in the literature have underlined the adverse effects of the increase in trade policy uncertainty. For example, according to Sudsawasd and Moore (2006), trade policy volatility induces greater trade policy uncertainty, which deters domestic investment. Rodrik (1991) has argued that even moderate levels of policy uncertainty can act as a hefty tax on private investment, and discourage private investment, in particular if the economic agents cast doubt on the permanent nature of the policy reform. Along the same lines, Rodrik (1995) has postulated that the perception by the private sector of a possible unsustainability of trade policy reform would result in an erosion of the credibility of the reform, and lead formerly protected firms to invest in lobbying efforts so as to restore protectionist policies. Drabek and Payne (2002) have shown that the degree of non-transparency plays a significant role in attracting FDI inflows. In particular, low levels of transparency featured by a high level of bribery and corruption, unstable economic policies, weak and poorly enforced property rights, and inefficient government institutions are

associated with low levels of FDI inflows. Tang and Wei (2009) have established that accessions to the WTO help to enhance domestic investment (that would benefit to trade and economic growth). Chemutai et al. (2017) have uncovered that WTO membership encourages both domestic and foreign investment. The negative FDI inflows effect of higher economic policy uncertainty have been pointed out by studies such as Im et al. (2021) and Canh et al. (2021). For example, Im et al. (2021) have demonstrated, *among others*, that greater economic policy uncertainty decreases the accuracy of firms' signals concerning investment opportunities. This impacts in an asymmetrical way, their capacity to acquire information, and induces a persistence in underinvestment. Canh et al. (2021) have obtained that while rising domestic economic policy uncertainty deters FDI inflows, an increase in the global (world) economic policy uncertainty could drive in FDI flows. We infer here that as the utilization of NRTPs can be associated with higher FDI inflows (e.g., Gnanon, 2021; Yannopoulos, 1986, 1987), one could expect that by reducing trade policy uncertainty and promoting FDI inflows, WTO membership would induce higher utilization rates of NRTPs than non-WTO membership. Likewise, as higher trade policy uncertainty results in lower trade flows (e.g., Crowley et al., 2018; Feng et al., 2017; Handley, 2014; Handley and Limão, 2015), it follows domestic policy anchoring, and enhancement of credibility to undertake policy reforms thanks to WTO membership could lead to a better utilization of NRTPs by developing members compared to non-WTO developing members. These positive effects may be stronger for WTO members that joined the WTO under Article XII<sup>18</sup> of the Marrakesh Agreement establishing the WTO. Article XII members are those whose process of accession to the WTO is governed by Article XII of the Marrakesh Agreement establishing the WTO. This process requires that the acceding country and the WTO agreed to the terms of accession, and that the accession applies to all WTO agreements (the so-called single undertaking) (e.g., Brotto et al., 2021). It entails rigorous procedures and has been associated with significant domestic reforms (e.g., Basu et al., 2008; Brotto et al., 2021; Campos, 2004).

Incidentally, WTO membership could affect the utilization of NRTPs through its influence on domestic institutional and governance quality. Studies such as Barton et al. (2006), Tang and Wei (2006) and World Bank (2006) have noted that membership to an international organization (including the WTO) could signal to foreign investors that the country will furnish to foreign and domestic actors the information required to assess market and political conditions. As noted above, according to Drabek and Bacchetta (2004), WTO membership helps to improve governance and implement better economic policies. Basu et al. (2008) have shown that under certain conditions, the accession process to the WTO can promote the establishment or improvement of trade-related institutions. While Ferrantino (2010) has found no significant effect of WTO accessions on governance, and Choudhury (2019) has reported no significant effect of WTO membership on domestic corruption, Aaronson and Abouharb (2014: p548) have pointed out that member states that adhere to three norms of good governance established by the WTO can experience an improvement in governance quality. These norms are even-handedness (i.e.,

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<sup>18</sup> Article XII of the Agreement establishing the WTO concerns the accession of states or customs territory to the WTO, and its first paragraph (i.e., Article XII.1) reads as follows: "*Any State or separate customs territory possessing full autonomy in the conduct of its external commercial relations and of the other matters provided for in this Agreement and the Multilateral Trade Agreements may accede to this Agreement, on terms to be agreed between it and the WTO. Such accession shall apply to this Agreement and the Multilateral Trade Agreements annexed thereto*". See information online at: [https://www.wto.org/english/docs\\_e/legal\\_e/04-wto.pdf](https://www.wto.org/english/docs_e/legal_e/04-wto.pdf) and [https://www.wto.org/english/thewto\\_e/acc\\_e/acces\\_e.htm](https://www.wto.org/english/thewto_e/acc_e/acces_e.htm)

'non-discrimination' in the WTO jargon), access to information (or 'transparency' in the WTO jargon), and the administrative due process (i.e., the ability of members to review, comment upon, and challenge trade-related policies). The argument put forth by Aaronson and Abouharb (2014: p577) is that before their accession to the WTO, countries undertake significant changes to their laws, regulations, and behaviour concerning trade and trade-related policies, ranging from tax and competition policies to health and safety standards. These reforms are conducted with the assistance of the WTO Secretariat and under a close monitoring by a working party. Additionally, after joining the WTO, countries' trade policies are carefully reviewed by other member states under the trade policy review mechanism<sup>19</sup>. Thus, as member states adhere to these core values of the WTO during and after accession, they will, over time, learn from other member states, improve or develop sound trade-related institutions and trade policies, and ultimately enjoy a better trade-related governance that will progressively spillover into the polity as a whole. Their empirical analysis has provided support for the argument that policy anchoring during accession and greater support for policy anchoring depends on membership over time. Especially, results have revealed that new members performed well in terms of 'access to information', showed weak performance in terms of 'evenhandedness', and experienced no significant effect their membership on the 'due process' value of the WTO. Conversely, long-standing WTO members exhibited stronger performance on metrics of 'due process' and 'access to information', but showed weaker performance on metrics of 'evenhandedness'. Additionally, the authors have found support for their hypothesis that the norms of good governance promoted by the WTO gradually filter into the polity as a whole. Against this background, we postulate that if WTO membership contributed to improving governance in the member states (more than in non-WTO members), then WTO developing members would experience a higher utilization of NRTPs than non-WTO developing members. This is also because a better governance quality contributes to establishing a business-friendly environment that fosters exports through the enforcement of contracts (e.g., Anderson and Marcouiller, 1999), the reduction of transaction costs for trading firms (e.g., Álvarez et al., 2018; Bah et al., 2021; Hernández et al., 2021) and the attraction of higher FDI inflows (e.g., Anyanwu, 2012; Buchanan et al. 2012; Busse and Hefeker, 2007; Jiang and Martek, 2021).

Joining the WTO might not necessarily result in significant government revenue losses, as it compels the country to improve its governance and implement better economic policies, which could help limit the public revenue losses arising from greater trade liberalization (Drabek and Bacchetta, 2004). Buettner and Madzharova (2018) have established empirically that countries that joined GATT/WTO after 1990 had implemented tariff-cum-tax reforms, reduced tariff rates, and increased consumption tax rates by reforming or introducing a value added tax (VAT). Thus, while the entry into the GATT/WTO has resulted in lower import-related tax revenue, it has helped countries to implement less distortive tax reforms and, revenues from consumption taxes have been able to successfully more than compensate the losses of trade tax revenue. This gain in public revenue may help WTO developing members (compared to non-WTO member) increase investments in trade-related infrastructure so as to reduce trade costs and foster the utilization of NRTPs.

A number of works have also established that the WTO/GATT membership affects export product diversification, as it generates an expansion of exports of products at the intensive and/or

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<sup>19</sup> See information online at: [https://www.wto.org/english/tratop\\_e/tpr\\_e/tp\\_int\\_e.htm](https://www.wto.org/english/tratop_e/tpr_e/tp_int_e.htm)

the extensive margins (e.g., Dutt, 2020; Dutt et al., 2013; Felbermayr and Kohler, 2010; Helpman et al., 2008; Liu, 2009). For example, Dutt (2020) has found that WTO membership increases both the extensive and intensive margins of trade over time, with the magnitude of this effect being stronger on the extensive trade margins than on the intensive trade margins. We can, therefore, expect that through its positive effect on export product diversification, WTO membership could enhance the utilization of NRTPs.

Besides previously described positive effects of WTO membership on the utilization of NRTPs, there may be some instances where non-WTO developing members may make a better usage of NRTPs than WTO developing members. First, the literature has pointed out a number of factors (in the side of the preference granting countries) that could limit the utilization of NRTPs by beneficiary countries, including both WTO beneficiaries and non-WTO beneficiaries. These factors are the erosion of preference margins (materialized through the decline in the difference between the preferential tariff rate and the MFN tariff rate), the inadequate product coverage<sup>20</sup> of the preference scheme, the instability or uncertainty of the market access to the preference granting country, and the stringency of the rules of origin associated with the preferences (e.g., Hakobyan, 2020; Herz and Wagner, 2011b; Persson, 2015b; Silva, 2011). These factors could affect in different ways the ability of the beneficiary countries to use NRTPs, and hence the degree of utilization of trade preferences by WTO developing members versus non-WTO developing members. For example, Silva (2011) has noted that the choice of countries that would be eligible to NRTPs is at the discretion of the preference grantors, as the latter attach some conditionalities<sup>21</sup> to the offer of NRTPs (for example, GSP schemes). This raises questions about the predictability of these preferences (Zappille, 2011). Likewise, Hakobyan (2020) has uncovered that the expiration of the United States' GSP scheme in 2011 significantly reduced developing countries' exports to the United States' market, and this negative export effect has been persistent over time.

Furthermore, Özden and Reinhardt (2005) have obtained empirically that countries that were excluded from the entitlement to GSP offered by the United States tended to adopt more liberal trade policies than countries that continued to benefit from the preference scheme. The authors have offered two explanations for this negative effect of the United States GSP program on beneficiary countries' trade policies. The first one is that these programs may have provided dis-incentives to the beneficiary countries' export groups to exert political pressures for trade liberalization, thereby offering the opportunity to import-competing groups to lobby for protectionist measures. The second explanation is that the eligibility to the United States GSP program is influenced by traditional protectionist pressures in the donor-country, especially because there were no GATT legal constraints. Overall, the adverse effect of the United States' GSP program on beneficiary countries' trade policies is a combination of domestic political economy dynamics within both developing countries and preference-granting countries (i.e., wealthier countries). What is the implication of this outcome for the present analysis?

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<sup>20</sup> For example, as not all products exported by beneficiary countries are eligible for NRTPs (including GSP schemes), beneficiary countries are likely to supply eligible products even if the latter do not reflect their comparative advantages and are not competitive (e.g., Herz and Wagner, 2011b; Silva, 2011). This effect could be compounded by the rules of origin attached to the preferential schemes influence sourcing decisions, including by favouring geography over cost (Tobin and Busch, 2019).

<sup>21</sup> These conditionalities include intellectual property rights, investor rights, and labour standards (Silva, 2011).

If this finding by Özden and Reinhardt (2005) applies to all types of NRTPs, including both GSP schemes and other trade preferences, then one can argue that exporting firms in the beneficiary countries that use imported intermediate goods may end up bearing higher production costs due to the increased trade barriers (for example, tariffs) on intermediate inputs sourced from overseas. While trade policies implemented by WTO members are constrained by WTO rules, members whose bound<sup>22</sup> tariffs exceed the applied tariffs still have the possibility (from the WTO law perspective) to raise their applied tariffs. However, raising applied tariffs on intermediate inputs can undermine export performance and discourage the utilization of NRTPs (e.g., Collier and Venables, 2007; Feng et al., 2016; Hayakawa et al. 2020; Milner, 1988; Mukherjee and Chanda, 2021). For example, Feng et al. (2016) have used Chinese manufacturing firms data to show empirically that firms that expanded their intermediate input imports also enjoyed an expansion of the volume and scope of their exports, and these effects were the largest when the imported inputs were purchased by private firms or firms that started out as non-traders. Moreover, intermediate imported inputs sourced from the higher-income G7 countries were particularly helpful in enhancing firm exports to the presumably more-demanding G7 export markets. Hayakawa et al. (2020) have established empirically a new mechanism through which reductions in import tariffs result in export expansions. They have shown that a 1% reduction in an importer's tariffs generates a rise in the import freight rates by around 0.8%, a fall in the export freight rates by around 1.1%, and an increase in the export quantity by 0.6% to 1%. Likewise, Mukherjee and Chanda (2021) have used data on Indian manufacturing firms to obtain empirically that tariff reductions on final goods have resulted in lowered markups for these firms, while lower input tariffs have increased their markups. It is worth noting that tariff liberalization on intermediate inputs has benefited more to markups of large firms as opposed to Micro, small and medium-sized enterprises.

Against this background, even though NRTPs may result in a lesser extent of trade liberalization in the beneficiary country, it is still unclear whether it would generate a lower or higher degree of trade liberalization in WTO developing countries versus non-WTO developing members. The issue remains an empirical matter. Nevertheless, we may be tempted to argue that the magnitude of the negative trade policy liberalization effect of NRTPs (if any at all) may be lower in WTO developing countries than in non-WTO developing countries. This is because Bacchetta and Piermartini (2011) have reported empirical evidence that countries are more likely to reduce applied tariffs of tariff lines that had been bound (rather than increase them), and this 'taming' effect of the binding of tariffs decreases with the level of the water (i.e., the gap between bound and applied tariff).

In line with the findings by Özden and Reinhardt (2005), Hoekman (2005b) has stressed that NRTPs have led to significant discrimination among developing countries, and incentivized beneficiary countries to oppose MFN-based trade liberalization, thereby creating less certainty and predictability of trade policy. Conconi and Perroni (2015) have explored the theoretical rationale for WTO rules on S&D treatment for developing countries. They have developed a model of bilateral trade between a small country and a large trading partner, where the small country lacks the credibility in terms of commitment to trade policy liberalization. This weak domestic commitment in trade policy arises from the fact that investors in the import-competing sector

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<sup>22</sup> Negotiated bound tariffs levels are the highest levels of tariffs that a WTO member commits not to exceed, and that are charged on other WTO members.

lobby the government to enact and maintain protectionist policies. They have then shown that in a reciprocal trade agreement where the large country reduces its tariffs conditionally on the small country moving in the same direction, creates a 'carrot and stick' mechanisms that helps the small country to overcome its commitment problem concerning trade policy liberalization. They have concluded that S&D provisions in the WTO Agreements can help developing countries to liberalize and improve their trading prospects if they are reconciled with the principle of reciprocity.

In a more recent study, Tobin and Busch (2019) have tested and provided empirical support for the hypothesis that GSP programs exert a negative effect on beneficiary countries' trade by reducing their imports, when beneficiary countries become GATT/WTO members. This is because exporters in GSP beneficiary countries that become GATT/WTO members de-mobilize politically because the multilateral trade regime lessens their concern for ad hoc conditionality<sup>23</sup> (their access to the markets of preference-granting countries is not subject to trade liberalization at home). This leads to greater trade protectionism and to reduced imports, which may be a disadvantage for WTO members compared to non-WTO members in terms of the utilization of NRTPs. This is to argue that the reduction of imports as an outcome of WTO membership may lead WTO developing countries to experience a lower degree of the utilization of NRTPs than non-WTO developing countries, given the potential role of imports of intermediate inputs in promoting exports (see above).

In light of this whole discussion, we are tempted to argue that the positive effects of WTO membership on the utilization rate of NRTPs would likely outweigh their negative effects on the usage of these preferences, though this remains ultimately an empirical matter (*Hypothesis 1*). One should not also lose sight of the fact that WTO membership may have opposing effects on the two blocks of NRTPs (i.e., GSP programs and other trade preferences programs) or a higher effect on one block of NRTP (e.g., here GSP programs) compared to the others (e.g., 'other trade preferences programs) because of possible the potential overlap between available NRTPs.

### ***3.2. Effect of the duration of WTO Membership on the utilization of NRTPs***

At the outset, in light of the above discussion on the possible channels through WTO membership could positively affect the utilization of NRTPs, one could argue that these benefits may amplify and become stronger for long-standing WTO members compared to those that recently joined the WTO. Put it differently, we can a priori argue that the duration of WTO membership would exert a positive effect on the utilization of NRTPs, with the magnitude of this positive effect amplifying over time.

The WTO provides a forum for negotiating rules that govern the cross-border movements of goods and services. It, therefore, allows its member states to participate actively in these negotiations and defend their interests in the course of these negotiations, including through alliances with other members. As noted above, developing members enjoy many flexibilities to implement WTO Agreements and better integrate into the multilateral trading system, and the

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<sup>23</sup> The GATT/WTO makes GSP non-discriminatory, not that GSP, by itself, is non-reciprocal. In the event a NRTP is conditioned upon the respect by a beneficiary country for intellectual property or workers' rights, its exporters will have to lobby on a wide variety of commercial and foreign policies. As the membership in the GATT/WTO makes the effect of non-reciprocity (of trade preferences) more credible, it will provide incentives to exporters to demobilize more fully

LDCs among them, receive the greatest flexibilities and special treatment in trade negotiations (e.g., United Nations, 2018, Chapter2; WTO, 2021; WTO/EIF, 2020).

The bargaining network offered by the WTO to its members helps to reduce the transaction costs of negotiating trade agreements incurred by individual member state. Otherwise, global trade liberalization would have been achieved through negotiations by individual state of hundreds or thousands of bilateral or regional agreements, which would likely generate conflicts and discriminations in trade relations, and result in welfare inefficiency (e.g., Jones, 2009). The WTO 'network' allows member states to learn (over time) from each other, which enables the establishment of strong ties among countries. Members would then have the opportunity to exchange information on their respective economies, including on the business environment in which trading firms operate. In particular, developing member states can take advantage of their membership to the WTO by exchanging information on the advantages (and risks) that foreign firms would face when engaging in FDI in their countries. Such information, which is often not easily accessible to foreign firms<sup>24</sup>, could include the skill level of local labor, the conditions of infrastructure, the quality of bureaucrats, and explicit and implicit business rules and government regulations (e.g., Kimura and Todo, 2010). The exchange of this type of information (in the context of 'economic diplomacy') could reduce the costs for foreign firms to engage in FDI in developing countries, with a view to exploiting the country's comparative advantages and exporting under the preferential regimes.

The provision of development aid, notably AfT by developed members to WTO developing members also represents a quasi-government guarantee to private firms, and can encourage FDI inflows. This is because such aid can allow reducing investment risks subjectively perceived by firms that wish to invest in the recipient country (see Kimura and Todo, 2010). Additionally, by acting as a forum for negotiations, the WTO allows members to exchange best practices concerning the design of policies and regulations needed to implement WTO Agreements. In particular, developing members could learn from their counterparts from developed countries about business practices, trade-related law, and systems<sup>25</sup>, and try to adapt those to the realities of their economies.

All these advantages associated with the membership in the WTO 'network' could enable the improvement of the business environment in the developing members, encourage domestic investment and innovation, attract FDI flows, and ultimately enhance the usage of NRTPs, compared to non-WTO developing members. In light of the foregoing, we can postulate that these advantages/benefits of WTO membership could amplify over time such that long-standing WTO members would experience a higher utilization of NRTPs than WTO members with a low duration of membership, and even more so than non-WTO members that are also beneficiary countries (as the WTO membership duration for the latter is equal to zero). Nevertheless, as stated above, the duration of WTO membership may not affect in the same way all NRTPs available to a country because it may deliberately opt to use some NRTPs at the expense of others.

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<sup>24</sup> Such an information would not have been easily obtained by countries' trading partners, notably developed ones (and hence their domestic firms) if the country was not member of the WTO.

<sup>25</sup> Kimura and Todo (2010) have argued that the provision of development aid by donor-countries (including developed countries) to developing ones represents a channel for the developing countries to learn from the best business practices, rules and systems of developed countries, and possibly adopt them as benchmarks.

However, in light of the findings by Özden and Reinhardt (2005) that GSP programs (or eventually NRTPs in general) can lead beneficiary countries to adopt restrictive trade policies, and given that when beneficiary countries become members of the GATT/WTO, they import less (Tobin and Busch, 2019), we can hypothesize that the cumulative effects (over time) of restrictive trade policies may lead the duration of WTO membership to reduce members' exports in general, and in particular their exports to the preference-grantors' markets. As a consequence, WTO members may experience lower utilization rates of NRTPs than non-WTO members, as the duration of the membership in WTO expands.

Overall, at this stage of the analysis, while the direction of the effect of WTO membership duration on the utilization of NRTPs is a priori unknown, we may argue that the positive effects of this duration may outweigh its negative ones so that the WTO membership duration would ultimately exert a net positive effect on the utilization of NRTPs (*Hypothesis 2*). Nonetheless, the issue remains an empirical matter, and once again, the duration of WTO membership may exert opposing effects on the two blocks of NRTPs (i.e., GSP programs and other trade preferences programs) or lead to a higher effect on one NRTP than on the other.

#### 4. Empirical strategy

This section presents the model specifications that help to perform the empirical analysis (see sub-section 4.1). It then provides an analysis of data concerning key variables of interest in the analysis (sub-section 4.2). It finally discusses the appropriate economic approach for conducting the empirical analysis (sub-section 4.3).

It is worth pointing out that from now onwards, the expression 'WTO membership' refers to years (of the period under analysis) during which a country had been a WTO member, while the expression 'non-WTO membership' refers to years (of the period under analysis) during which a country had not been a member of WTO. Thus, 'non-WTO membership' can concern both countries that never joined the WTO (over the period under analysis) as well as countries that joined the WTO, but for the latter it captures only years during which they were not members of the WTO. These definitions have an implication for the interpretation of outcomes. Let us consider a dummy variable "WTO" that represents the 'WTO membership', i.e., it takes the value "1" for years of WTO membership, and the value "0" for years during which a country had not joined the WTO. A positive effect of the dummy "WTO" on the utilization rate of a given NRTP would indicate that on average, over the sample, being member of the WTO induces a higher utilization rate of the NRTP than not being a WTO member. Put it differently, we are comparing how countries perform in terms of the utilization of NRTPs during years of WTO membership on the one hand, and during years of non-WTO membership, on the other hand, bearing in mind that the 'non-WTO membership' concerns not only countries that joined the WTO in a given year over the period under analysis (but here it captures only years during which countries were not members of the WTO - the dummy 'WTO' takes '0' for those years) as well as countries that never joined the WTO (here the dummy 'WTO' always takes "0" for every year of the period under analysis). This further justifies why it is relevant to also examine how the duration of WTO membership affects the utilization of NRTPs.

Summing-up, for the interpretation of estimations' outcomes, for example, the expression "WTO members experience a higher utilization rate of GSP programs (let us say, by 4 percentage points) than non-WTO members" would signify that "the utilization rate of GSP programs is higher (by 4 percentage points)



during the years of WTO membership compared to years of non-WTO membership". This is not exactly similar to the situation where we compare the performance (in terms of utilization of NRTPs) of WTO members (i.e., countries that had been members of the WTO for every year of the entire period under analysis) to non-WTO members (i.e., countries that had not been members of the WTO for every year of the period under analysis).

These being noted, let us turn to the presentation of the model specification.

#### 4.1. Model specification

The main purpose of this paper is to investigate empirically the effect of WTO membership, and in particular the duration of this membership on the utilization of NRTPs (GSP programs and other trade preferences). To recall, we postulated the hypothesis that this effect could work through a variety of channels, including the harnessing of the benefits associated with the WTO membership such as domestic policy anchoring, which helps to improve domestic economic policies, and eventually institutional and governance quality; the benefice of higher AfT flows (compared to non-WTO members) to enhance trade capacity, the possibility to attract higher FDI inflows (compared to non-WTO members), and the exploitation of the WTO network to 'sell' the existing opportunities for trading firms in their respective countries so as to expand their exports. Nevertheless, the usage of NRTPs may lead WTO members to implement more restrictive trade policies because easier access to foreign markets could incentivize exporting firms to de-mobilize politically in terms of support for trade liberalization, thereby offering the opportunity to import-competing groups to lobby for protectionist measures. As a result, export firms would experience higher import costs (due to greater protectionist measures) and hence higher production costs that would hinder the utilization of NRTPs.

Building on previous works on the macroeconomic determinants of the utilization of NRTPs that have used a country-product/year framework (e.g., Manchin, 2006; Nilsson, 2016; Sytsma, 2021), and drawing specifically from the recent work by Gnanngnon and Iyer (2021) that has relied on a country-year framework to examine the effect of AfT flows and FDI inflows on the utilization of NRTPs, we postulate the following two model specifications (one model for the utilization of each block of NRTP):

$$URGSP_{it} = \alpha_0 + \alpha_1 URGSP_{it-1} + \alpha_2 VARINT_{it} + \alpha_3 UROTP_{it} + \alpha_4 \text{Log}(GDPC)_{it} + \alpha_5 FINDEV_{it} + \alpha_6 TERMS_{it} + \alpha_7 \text{Log}(POP)_{it} + \mu_i + \delta_t + \epsilon_{it} \quad (1)$$

$$UROTP_{it} = \beta_0 + \beta_1 UROTP_{it-1} + \beta_2 VARINT_{it} + \beta_3 URGSP_{it} + \beta_4 \text{Log}(GDP)_{it} + \beta_5 FINDEV_{it} + \beta_6 TERMS_{it} + \beta_7 \text{Log}(POP)_{it} + \rho_i + \theta_t + \omega_{it} \quad (2)$$

$i$  and  $t$  represent respectively a country and the time-period. The coefficients  $\alpha_0$  to  $\alpha_7$ , and  $\beta_0$  to  $\beta_7$  are parameters that would be estimated.  $\mu_i$  and  $\rho_i$  are time invariant specific characteristic of each country in the panel dataset.  $\delta_t$  and  $\theta_t$  are time dummies acting for global shocks that could affect simultaneously all beneficiaries' utilization rates of trade preferences.  $\epsilon_{it}$  and  $\omega_{it}$  are well-behaving error-terms.

On the basis of data available, we have constructed an unbalanced panel dataset of 136 countries over the period 2002-2019, using annual data.

The variable "URGSP" is the utilization rate (in percentage) of GSP programs offered by the QUAD countries to developing countries and specifically to LDCs. It represents the extent to which eligible imports for GSP programs are actually imported under these preferences. It has been computed as follows:  $URGSP = 100 * (\text{GSP received imports}) / (\text{GSP covered imports})$ , where "GSP received imports" refers to the value of imports that received GSP treatment, and "GSP covered imports" indicates the value of imports that are classified in tariff lines that are dutiable and covered by the GSP scheme of the preference-granting country.

The indicator "UROTP" is the utilization rate (in percentage) of the other NRTPs provided by the QUAD countries to developing countries and specifically to LDCs among them. 'Other trade preference' cover for the USA, the African Growth and Opportunity Act (AGOA) and the Caribbean Basin Initiative. For the EU, they include preferences under the Economic Partnership Agreements entered with selected Sub-Saharan Africa countries. The utilization rate of other trade preferences has been computed as follows:  $UROTP = 100 * (\text{Other-Preferential Imports}) / (\text{Other-Preferential Covered Imports})$ . "Other-preferential imports" refers to the value of imports that benefitted from NRTPs other than GSP programs. "Other-preferential covered imports" refers to the value of imports that are classified in tariff lines that are dutiable, and covered by the other-preferential schemes.

Higher values of "URGSP" and "UROTP" indicate an improvement in the utilization of the respective NRTP, and declining values of each of these indicators reflect lower utilization of the NRTPs. We collect data on both "URGSP" and "UROTP" from the UNCTAD database (see Appendix 1).

Our variable of interest is "VARINT". It is either a dummy variable capturing the WTO membership for a given country in our panel dataset, or a variable measuring the duration of the WTO membership for the country concerned (denoted "NUMBWTO"). The dummy capturing the WTO membership is denoted "WTO", and takes the value "1" for WTO members<sup>26</sup> and "0", otherwise. The duration of WTO membership is, for a given country and for each year, measured by the elapsed time (i.e., number of years) since the country has joined the WTO. Thus, this variable takes the value "0" for years during which the country was not a WTO Member, "1" for the first year the country became a WTO Member, "2" for the second year since it has joined the WTO,...etc, and this variable is incremented by 1 for any additional year until the last year (i.e., 2019) of the period under analysis. Note that for any country that had joined the WTO before 2002 (which is the first year of the period under analysis), the value of "1" has been attributed to the year (i.e., between 1995 and 2002) the country acceded to the WTO, and then incremented by 1 until the year 2019 (i.e., the last year of the period under analysis). For example, for countries that joined the WTO in 1995, the variable "NUMBWTO" takes the value of "1" in 1995, "2" in 1996, "3" in 1997,...etc, "8" in 2002,...and "25" in 2019.

The variables "GDPC" and "POP" represent respectively the real per capita income and the population size, and have been logged (using the natural logarithm) so as to reduce their skewed distributions. The regressors "FINDEV" and "TERMS" are respectively the indicators of financial development (measured by the share of the domestic credit provided to the private sector in GDP) and the terms of trade. All variables, with the exception of the indicators of utilization rate of

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<sup>26</sup> In fact, as of 29 July 2016, there are 164 WTO members (since 29 July 2016). The list of WTO members and the date of joining the WTO could be found online at: [https://www.wto.org/english/thewto\\_e/whatis\\_e/tif\\_e/org6\\_e.htm](https://www.wto.org/english/thewto_e/whatis_e/tif_e/org6_e.htm)

NRTPs, have been extracted from the World Development Indicators (WDI) of the World Bank (see Appendix 1 for more details). Note that variables capturing economic policies (including trade policies), institutional and governance quality, AfT flows or even FDI inflows could matter for the utilization rates of NRTPs (see Gngangnon and Iyer, 2021). However, they have not been introduced in models (1) and (2) because they represent possible channels through which the WTO membership and the duration of such membership could influence the utilization rate of NRTPs. We present in Appendix 1 the description and source of all variables contained in models (1) and (2). Appendix 2 reports standard descriptive statistics on these variables, and Appendix 3 presents the list of countries contained in the full sample and the sub-sample of LDCs. Appendix 4 displays the duration of WTO membership as at 2019 (end-year of the period under analysis).

Following Gngangnon and Iyer (2021), we have included the one-period lag of the dependent variable in the two baseline models specifications laid down above, with a view to capturing both a potential persistence (over time) of the utilization rate of NRTPs offered by the QUAD countries, and accounting *inter alia*, for omitted variables problems. The omitted variable problem could arise here from the fact that we have not introduced in these baseline model specifications regressors that capture the utilization rate of NRTPs provided by other wealthier countries than the QUAD countries (see the WTO database<sup>27</sup> on preferential trade arrangements). The one-period lag of dependent variable aims to help overcome this problem.

In terms of theoretical expectations of control variables, we postulate that a higher utilization rate of one (or some) NRTP(s) could be associated with a lower utilization rate of other NRTPs, when countries enjoy several NRTPs (e.g., Gngangnon and Iyer, 2021; Hakobyan, 2015; Keck and Lendle, 2012). As a result, we expect that the coefficient of each of the regressors "UROTP" and "URGSP" would be negative and significant respectively in models (1) and (2).

Similarly, countries with higher real per capita incomes are likely to have a greater export supply capacity than countries with relatively lower real per capita incomes (e.g., Gngangnon and Iyer, 2021; Manchin, 2006). Therefore, we can expect that a rise in the real per capita income would be associated with the betterment of the utilization of NRTPs. However, as some NRTPs may be utilized at the expense of others, thereby leading an improvement in the real per capital income to be associated with an improvement in the utilization of one block of NRTP (let us say GSP programs) at the expense of the other block of NRTP (i.e., other trade preferences).

Likewise, the population size can represent the internal market size and influence the quantity of products exported. For example, countries with larger populations are likely to export less than relatively small countries (i.e., with a relatively small population size) as they have to supply for the domestic market. In this case, a rise in the population size could negatively affect the utilization of NRTPs (although possibly to a lesser extent some NRTPs than others). By reflecting the availability of an abundant labour force in the domestic markets, a large population size may allow countries to reduce their production costs, as the available labour force would be used to produce both intermediate inputs (needed in the process of production of final goods) as well as final outputs. This could enhance the international competitiveness of the country and hence boost its usage of NRTPs (although some NRTPs at the expense of others) (see Gngangnon and Iyer, 2021).

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<sup>27</sup> See online at: <http://ptadb.wto.org/>

Financial development can positively affect the utilization of NRTPs if banks' credits are allocated to firms that export under the NRTPs, although in such a case some NRTPs may be privileged over others (see Gnangnon and Iyer, 2021).

Finally, we expect an improvement in the terms of trade to encourage exporting activities, including those under NRTPs.

#### 4.2. Data analysis

We start by analysing whether there are substantial differences or similarities concerning the behaviour of WTO members and non-WTO members in terms of utilization of NRTPs. We perform the Wilcoxon Rank-sum test (e.g., Conover, 1999; Harris and Hardin, 2013; Park, 2009; Wilcoxon, 1945). This is a nonparametric approach used to compare two independent samples using magnitude-based ranks. It has the advantage of not requiring any specific assumptions about the form of the probability distribution from which the data comes. In the present analysis, the Rank-sum test allows examining the distributions of the two indicators of the utilization rates of NRTPs in two samples of WTO members beneficiaries of NRTPs versus non-WTO members beneficiaries of NRTPs (i.e., in years of WTO membership versus years of non-WTO membership). NRTPs are here either GSP programs or other trade preferences. Programs.

Conceptually, this statistical test is similar (but not identical) to treatment studies where one group receives treatment, while the other is not treated (e.g., Park, 2009). Therefore, we consider whether there are significant differences among the two samples concerning the utilization of rate of GSP programs on the one hand, and the utilization rate of other trade preferences on the other hand. To illustrate how the test works (e.g., Park, 2009), let assume that there are  $m$  countries (beneficiaries of a given block of NRTP) that are WTO members and  $n$  countries (beneficiaries of a given block of NRTP) that are not members of the WTO.  $m$  may not necessarily be equal to  $n$ . Let us consider the set of observation  $(x_1, \dots, x_m)$  as the utilization rate of GSP programs by each of the  $m$  WTO members, and the set of observation  $(y_1, \dots, y_n)$  be the utilization rate of GSP programs by each of the  $n$  WTO members. The key issue here is to test whether the two samples are drawn from the same population. The rank-sum test consists of combining the set of observations  $(x_1, \dots, x_m)$  and the set of observations  $(y_1, \dots, y_n)$ , and ordering the whole set of observations  $(m+n)$  in ascending order (i.e., from the lowest rate of utilization of GSP programs to the highest one). The lowest observation is then assigned the number 1, the second lowest the number 2, the third lowest the number 3, ..., and the largest the number  $m+n$ .

Let us then denote  $S_x$  and  $S_y$  respectively the sum of the ranks of the  $x$  values, and the sum of the ranks of the  $y$  values. As  $S_x$  and  $S_y$  are a linear function of each other, the Rank-sum test can be performed on either  $S_x$  or  $S_y$ . Assume that we choose to perform the test on  $S_x$ . If the distributions of the two samples highlighted above are *identical*, then  $S_x$  is normally distributed with *mean*  $S_x^* = m(m+n+1)/2$  and *variance*  $\sigma^2 = mn(m+n+1)/12$ . Hence, the assumption of identical distributions can be rejected if  $S_x$  is too far from its expected value. This is assessed using the test-statistic  $z = (S_x - S_x^*)/\sigma$ , which is compared to the standard normal probability distribution. If  $z$  is sufficiently large, then the null hypothesis that "*the distributions of  $S_x$  and  $S_x^*$  are identical*" can be rejected. In such a case, WTO membership makes a difference.

Table 1 reports the results of the Rank-sum test performed considering WTO members versus non-WTO members to examine the distribution of the variables "URGSP" and "UROTP" over the entire sample, as well as the sub-groups of LDCs and NonLDCs within the full sample.

Thus, we test whether within each of these groups, member states (i.e., WTO members versus non-WTO members) exhibit different patterns in terms of the utilization rate of GSP programs, on the one hand, and in the utilization of other trade preferences, on the other hand. The focus on the sub-groups of LDCs and NonLDCs is explained by the fact that not only do LDCs receive more generous preferential concessions than other developing countries (i.e., NonLDCs) from preference grantors, but they even enjoy greater flexibilities in implemented WTO agreements than NonLDCs developing members.

Table 1 contains the z-statistic and the related probability value (i.e., p-value), which is the probability of falsely rejecting the assumption of identical distributions. This signifies that the higher the p-value (in particular higher than 0.10, at the 10% level of statistical significance), the lesser the chances that the WTO membership makes a difference in terms of the utilization of NRTPs. We note from this Table that the distributions of the utilization rate of GSP programs ("URGSP") are not significantly different between WTO beneficiaries of GSP programs, and non-WTO beneficiaries of GSP programs for the full sample (column [1]), the sub-sample of LDCs (column [2]) and the sub-sample of NonLDCs (column [3]). This is because across these three columns of the Table, the z-statistics are small, and their associated p-values are higher than 0.10 (see line 4 of Table 1). As per results in line 6 of Table 1 (and across columns [1] to [3]), the p-values associated with the z-statistics are equal to 0.000. These outcomes suggest that the distributions of the utilization rate of other trade preferences programs ("UROTP") are significantly different between WTO beneficiaries and non-WTO beneficiaries of these programs, over the full sample (column [1]), the sub-sample of LDCs (column [2]) and the sub-sample of NonLDCs (column [3]). In other words, within each of these groups (i.e., full sample, LDCs and NonLDCs), the behaviour of WTO members beneficiaries of other trade preferences programs is significantly different from the behaviour of non-WTO members beneficiaries of these programs, in terms of utilization of other trade preferences programs.

Summing-up, results reported in Table 1 convey the message that WTO members tend to behave differently from non-WTO members in terms of the utilization of other trade preferences, while there is no significant difference concerning their behaviour in terms of the utilization of other trade preferences programs. These findings do not prejudice the causality effects (uncovered through regressions) of WTO membership and the duration of this membership on the utilization rates of NRTPs.

Next, we compare the developments of the (average) of the indicators of the utilization of NRTPs and the average duration of WTO membership in the full sample and in the sub-samples of LDCs and NonLDCs (see Figures 1 to 3). Note that the average duration of WTO membership across countries and per year has been computed taking into account the duration for countries that are currently WTO members and those that have not yet joined the organization. We then plot in Figures 4 and 5 the correlation patterns between the indicators of the utilization of NRTPs and the duration of WTO membership over the full sample on the one hand, and over the sub-samples of LDCs and the sub-sample of NonLDCs, on the other hand.

Figure 1 shows that the average duration of WTO membership over the full sample ranges between 5.65 years (in 2002) and 19.9 years in 2019. While before 2004, the utilization rate of other trade preferences was lower than that of GSP programs, the situation reversed from 2004 to 2019 because over this sub-period, the utilization rates of the two NRTPs moved yet steadily upward, but the usage of GSP programs became lower than the utilization rates of other trade preferences.

The utilization rate of GSP programs went from 32.4% (against 26.5% for other trade preferences programs) in 2004 to 15.1% in 2019 (against 35.75% in 2019 for other trade preferences).

Figure 2 indicates that LDCs made a better use of other trade preferences than GSP programs between 2002 and 2008, although over this sub-period, the utilization rate of other trade preference had been declining while that of GSP programs had been increasing. The utilization rate of other trade preference decreased from 53.3% in 2002 to 20.4% in 2008, while the utilization rate of GSP programs rose from 13.2% in 2002 to 49.7% in 2008. From 2008 to 2019, the utilization rate of GSP programs exhibited an upward movement to reach 67.8% in 2019, while that of other trade preferences showed a downward path to reach 10.9% in 2019. In parallel, the average duration of WTO membership among all LDCs moved from 4.9 years in 2002 to 17.4 years in 2019.

For NonLDCs (see Figure 3), the average duration of WTO membership was 20.8 years in 2019 against 5.9 years in 2002. The patterns of the evolution of the utilization rates of NRTPs in NonLDCs are quite different from the ones described for LDCs. From 2002 to 2015, the utilization rate of GSP programs was consistently higher than that of the other trade preference programs, although the utilization of each of these blocks of NRTPs displayed different patterns over 2002-2010. The utilization rate of GSP programs moved from 39.5% in 2002 to 49.6% in 2010, and then declined to reach 39.3% in 2015, while at the same time, the utilization of the other trade preferences rose from 23.2% in 2004 to 46.8% in 2015, after having fluctuated between 2002 and 2004 (its value in 2004 was 32%). Between 2015 and 2019, NonLDCs had a greater utilization of the other trade preferences than of GSP programs, which represented a reverse situation compared to the period 2002-2015. Notwithstanding this, the usage of both GSP programs and other trade preferences moved upward to reach the same value, i.e., 47.9% in 2019 (this indicates that in 2019, NonLDCs made equal usage of the two blocks of NRTPs).

When comparing Figures 2 and 3, we note that in 2019, the average duration of WTO membership for NonLDCs was slightly higher than that of LDCs. At the same time, LDCs tended to make a higher utilization of GSP programs compared, whereas NonLDCs made a far higher utilization of the other trade preferences.

Figure 4 shows (for the full sample) a strong positive correlation pattern between the indicators of the utilization of other trade preferences programs and the duration of WTO membership. However, the correlation pattern between the utilization of GSP programs and the duration of WTO membership is unclear.

Figure 5 shows for LDCs that the duration of WTO membership is strongly positively correlated with the utilization of GSP programs, while the correlation between the duration of WTO membership and the utilization of other trade preferences is yet positive, but weak. Conversely, for NonLDCs, we observe a positive correlation pattern between the duration of WTO membership and the utilization of other trade preferences, but a negative correlation between the duration of WTO membership and the usage of GSP programs.

### ***4.3. Estimation approach***

This section discusses the econometric approach(es) that are suitable for estimating the models laid down in section 3. We commence the empirical analysis by examining the time series properties of the (non-transformed) variables capturing the utilization rate of NRTPs, namely "URGSP" and "UROTP", over the full sample. In other words, we test the presence of unit roots

in these two variables across the panel. This is because if these variables contain unit roots at the first order, i.e., they are integrated of order 1 (i.e., they are  $I(1)$ ), one may suspect the existence of a spurious relationship between each of these variables and other regressors (e.g., the duration of WTO membership) in models (1) and (2). Therefore, we perform four panel unit root tests (with individual effects and a linear trend) that are the test proposed by Im et al. (2003), the test proposed by Levin, Lin and Chu (2002), as well as the Fisher-type tests proposed respectively by Maddala and Wu (1999) and Hadri (2000). The null hypothesis of each of these tests is that the presence of a common unit root process in the time series for each variable (i.e., "URGSPI" and "UROTP") across the panel. All four tests generate p-values equal to 0 for each of the two variables capturing the utilization rate of NRTPs. This, therefore, suggests that we can reject the null unit root hypothesis at the 1% level of significance. These outcomes support the stationarity of the variables representing the utilization rates of NRTPs. As a result, we can estimate models (1) and (2) and their static versions (i.e., these models without the one-period lag of the dependent variable as a regressor) without the risk of running spurious regressions.

Next, we aim to estimate the static specifications of models (1) and (2) (i.e., each of these models without the one-period lag of the dependent variable) with a view to assessing how, on average across the full sample and various sub-samples described below, WTO membership and the duration of this membership affect the utilization rate of NRTPs. In so doing, we are measuring the long-run average effects respectively of WTO membership and the duration of the membership on the utilization rates of NRTPs, over the full sample and the sub-samples (Phillips and Moon, 1999).

To perform this analysis, we first conduct the Cluster-robust Hausman test proposed by Kaiser (2015) to select the appropriate estimator (i.e., fixed effects estimator versus random effects estimator) to estimate the static specifications of models (1) and (2). When robust standard errors are clustered at the cross-sectional level in the fixed effects-based regressions, the standard Hausman test has size distortions<sup>28</sup> (see Kaiser, 2015). For the static specifications of model (1) where the variable "VARINT" is measured by the "WTO" dummy, the outcomes of the Cluster-robust Hausman test suggest a statistic Chi-square of 221.1, with the associated p-value equal to 0.000. The Cluster-robust Hausman test applied to the static specifications of model (1) where the variable "VARINT" is measured by the variable "NUMBWTO" generates Chi-square of 120.5 and an associated p-value equal to 0.000. The same test applied to the static specifications of model (2) when "VARINT" is the dummy "WTO" shows a Chi-square statistic of 105.7 and a p-value amounting to 0.000. When applied to the static specifications of model (2) with "VARINT" being measured by the variable "NUMBWTO", the Cluster-robust Hausman test indicates a Chi-square statistic amounting to 62.74, and an associated p-value equal to 0.000. On the basis of these findings, we can conclude that the fixed effects estimator is more appropriate to estimate the static specifications of models (1) and (2). We, therefore, employ the fixed effects estimator with Driscoll and Kraay (1998)' standard errors (denoted "FEDK") to perform these different specifications (i.e., with the variables "WTO" and "NUMBWTO") of the static version models (1) and (2). The approach by Driscoll and Kraay (1998) helps to correct standard errors of estimates obtained when using the standard within fixed effects estimator. Standard errors are corrected for the presence of heteroscedasticity, serial correlation, and contemporaneous cross-sectional dependence in the

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<sup>28</sup> For example, see also Gozgor and Ranjan (2017) who have also applied this technique in their analysis.

residuals. In addition to the regressions based on the FEDK estimator, we also present the outcomes of the regressions based on the pooled ordinary least squares (POLSDK) estimator where standard errors have been corrected using the Driscoll and Kraay (1998) approach. The purpose of doing so is merely to compare the outcomes obtained when using the FEDK and POLSDK estimators.

We estimate the static versions of models (1) and (2) (using the variables "WTO" and "NUMBWTO" as alternative measures of "VARINT") over the full sample, the sub-samples of LDCs and NonLDCs (i.e., countries in the full sample that are not in the category of LDCs). The outcomes of these different estimations are summarized in Table 2 focusing specifically on the effect of the WTO membership and the duration of this membership on the usage of NRTPs. Detailed outcomes are presented in Tables 2a to 2d.

While results reported in Tables 1 and 2 provide a guidance on how WTO membership and the duration of this membership could affect the utilization rate of NRTPs, one may question whether WTO membership is endogenous due to the bi-directional causality between the variable "VARINT" and the dependent variable. As a matter of fact, while as expected, WTO membership could affect the utilization rate of NRTPs, it is possible that beneficiaries of NRTPs that were not WTO members and that experienced low utilization rates of NRTPs may wish to join the WTO given the latter's potential advantages, including in terms of fostering the utilization of NRTPs. Therefore, we consider the variable "VARINT" in models (1) and (2) as endogenous. It follows that we need to find the suitable estimator for estimating the dynamics models (1) and (2), bearing in mind the difficulties of finding external instruments of the variables capturing WTO membership and its duration, as well as for the one-period lag of the dependent variable.

We estimate models (1) and (2) in their dynamic forms (i.e., as they are presented) using the two-step system Generalized method of moments (GMM) estimator proposed by Arellano and Bover (1995) and Blundell and Bond (1998). This estimator is suitable for dynamic panel datasets with large N and relatively small T, and is largely used in the macro-empirical research. Not only does it help to overcome the potential correlation<sup>29</sup> between the lagged dependent variable and the fixed effects in the error term, but it also permits to handle potential endogeneity issues arising from the bi-directional causality problem highlighted above, measurement errors, and omitted variables. It involves estimating a system of equations that combines an equation in differences with an equation in levels, where lagged first differences are used as instruments for the levels equation, and lagged levels are used as instruments for the first-difference equation.

The appropriateness of the two-step system GMM estimator for estimating the dynamic models (1) and (2) and its different variants (described below) is evaluated by means of a set of standard tests. The latter include the Arellano-Bond test of the presence of first-order serial correlation in the first-differenced error term ( $AR^{30}(1)$ ); the Arellano-Bond test of the absence of second-order autocorrelation in the first-differenced error term (denoted  $AR^{31}(2)$ ) and the Sargan test of over-identifying restrictions<sup>32</sup> that tests the validity of instruments used in the regressions.

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<sup>29</sup> Given the small-time dimension (i.e.,  $T = 18$  years) of the panel dataset, this correlation would lead to biased estimates (known as Nickell bias - Nickell, 1981) if the dynamic models were to be estimated by means of the fixed effects estimator.

<sup>30</sup> It is expected that the p-value associated with the statistic of the AR(1) test should be lower than 0.1 at the 10% level.

<sup>31</sup> The p-value associated with the statistic of the AR(2) test is expected to be higher than 0.1 at the 10% level.

<sup>32</sup> The p-value associated with the statistic of the Sargan test is expected to be higher than 0.1 at the 10% level.



In light of the possible endogeneity of the variable "VARINT" highlighted above, we have treated it as endogenous in all regressions based on the two-step system GMM approach. We also report the outcomes of the test of absence of third-order autocorrelation in the first-differenced error term (denoted AR<sup>33</sup>(3)), as the presence of third-order autocorrelation in the first-differenced error term may indicate that the model specification suffers from the omitted variables problem. Additionally, to avoid instruments proliferation in the regressions, we ensure that the number of instruments used in the regressions is lower than the number of countries (e.g., Roodman, 2009). To that effect, the regressions based on the two-step system GMM approach utilize 2 lags of the dependent variable as instruments, and 2 lags of endogenous variables as instruments.

We follow Hakobyan (2015) and consider the regressor measuring the utilization rate of NRTPs ("UROTP" in model (1) and "URGSP" in model (2)) as exogenous, although Gnanon and Iyer (2021) have considered this variable as endogenous in their analysis. Furthermore, we have treated the variable "FINDEV" as exogenous, although the work by Gnanon and Iyer (2021) has treated it as endogenous. We do so because the financial sector does not finance only firms that export under NRTPs, but potentially all possible exporters. Thus, we might not expect to see a strong feedback effect of the level of utilization of NRTPs on financial development. Incidentally, both the financial development variable and the regressors measuring the utilization rate of NRTPs in models (1) and (2) have been treated as exogenous because when they were treated as endogenous, the number of instruments significantly exceeds the number of countries (and endogenous variables might be overfitted, as highlighted by Roodman, 2009). Additionally, the coefficient of our variable of interest does not change substantially when we compare the regressions where the variables representing the utilization rates of NRTPs and financial development are treated as exogenous with regressions where they are treated as endogenous. It is worth recalling that the present analysis is being carried out using annual data (over 18 years), while the analysis by Gnanon and Iyer (2021) has used 6 non-overlapping sub-periods of 3 years. Summing-up, the empirical analysis based on the two-step system GMM approach treats the variables "VARINT" as endogenous, while the other regressors in the analysis have been treated as exogenous.

The regressions based on the two-step system GMM estimator provide short term effects of regressors on the dependent variable (these are the direct estimates obtained from the regressions), while long term effects<sup>34</sup> of these regressors, including those of interest in the analysis ("WTO" dummy and "NUMBWTO") could be obtained as the ratio of the estimate associated with a given regressor (i.e., the short-term effect of this variable) to the value equals to 1 minus the coefficient of the lag dependent variable<sup>35</sup>.

Tables 3 and 4 contain the results stemming from estimating several variants of models (1) and (2) using the two-step system GMM estimator. The variable "VARINT" is measured by the dummy "WTO" in the different specifications of the dynamic models (1) and (2) used to obtain

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<sup>33</sup> The p-value associated with the statistic of the AR(3) test is expected to be higher than 0.1 at the 10% level.

<sup>34</sup> Philipps and Moon (1999) have qualified the long-run coefficients as the "average long run" effects of a given regressor on the dependent variable.

<sup>35</sup> More generally, in a dynamic model  $Y_{it} = \beta_0 + \beta_1 Y_{it-1} + \beta_2 X_{it} + \omega_{it}$ , the coefficient  $\beta_2$  represents the short-term effect of X on Y, while the long-term effect of X on Y is given by  $\frac{\beta_2}{(1-\beta_1)}$  (see for example, Smith and Fuertes, 2010: p30).

estimates reported in Table 3. Likewise, "VARINT" is measured by the variable "NUMBWTO" in the different specifications of models (1) and (2) used to obtain estimates reported in Table 4.

Columns [1] and [2] of Table 3 present the estimates that help to examine the effect of WTO membership on the utilization rate of NRTPs, and are obtained by merely estimating models (1) and (2) as they stand.

Columns [3] and [4] of Table 3 contain outcomes that allow examining how WTO membership affects the utilization rate of NRTPs in LDCs versus NonLDCs. These results are obtained by estimating different other specifications of models (1) and (2) that contain the interaction between the dummies "WTO" and "LDC", the latter being a variable taking '1' for LDCs, and '0' for other countries in the full sample, i.e., NonLDCs. The list of LDCs is provided in Appendix 3.

Finally, columns [5] and [6] of Table 3 report estimates that help to assess the effects of WTO membership on the utilization rate of NRTPs for members that joined the WTO under Article XII<sup>36</sup> versus other countries in the full sample (i.e., non-Article XII members, which are WTO members that did not join the organization under the rigorous procedures required by Article XII of the WTO Agreement). As the accession process under Article XII of the Marrakesh Agreement establishing the WTO has been associated with significant domestic reforms, and in particular with the establishment or improvement of trade-related institutions (e.g., Basu, 2008; Basu et al., 2008; Brotto et al., 2021; Campos, 2004), we expect that states that acceded to the WTO under Article XII could experience a positive effect on the utilization of NRTPs. In other words, these estimates help to check whether countries that joined the WTO under rigorous procedures make better or lesser use of NRTPs than countries that joined the organization under less stringent procedures. To obtain these outcomes, we estimate two specifications of models (1) and (2) in which we introduce the dummy "DUMART12", and its interaction with the dummy "WTO". "DUMART12" takes the value "1" for WTO members that joined the WTO under Article XII, and "0" for WTO members that did not join the organization under Article XII.

Table 4 presents the same structure as Table 3, with the exception here that the variable "VARINT" is measured by the variable "NUMBWTO".

## 5. Results' interpretation

Results reported in Table 2 show that estimates obtained from regressions based on the POLSDK estimator are often different from those obtained using the FEDK estimator (differences concern both the direction and the magnitude of the effects).

Results obtained using the POLSDK estimator to estimate the effect of WTO membership on the utilization of NRTPs (see *lines 6 and 7* of Table 2) show that over the full sample, the effects of WTO membership on the utilization rates of NRTPs are positive and significant at the 1% level, with the effect being far stronger for the utilization of other trade preferences programs than for the usage of GSP programs (columns [1] and [2] of the Table). These outcomes suggest that WTO members enjoy a higher utilization rate of GSP programs (i.e., by 9 percentage points) than non-WTO members beneficiaries of these trade preferences (see column [1] of Table 2). Similarly, at the 1% level, the utilization rate of other trade preferences is, on average, higher (i.e., by 20.6 percentage points) for WTO members than for non-WTO members beneficiaries of these

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<sup>36</sup> The list of Article XII WTO members (as at 2019) used in the analysis is provided in Appendix 4.

preferences (see column [2] of Table 2). Among LDCs, WTO members experience on average a higher utilization rate (by 7.1 percentage points of GSP programs) than non-WTO members, but this outcome is significant only at the 10% level (see column [3] of Table 2). At the same time, we obtain from column [4] of the same Table that at the 1% level, WTO LDC members make a better usage of other trade preferences than non-WTO LDC members: on average, the utilization rate of other trade preferences is 13.6 percentage points higher in WTO LDC members than in non-WTO LDCs. In any case (that is, even at the 10% level), for LDCs, the magnitude of the positive effect of WTO membership on the utilization of other trade preferences far exceeds the magnitude of its positive effect on the utilization of GSP programs. This finding applies also to NonLDCs, although the effects of WTO membership on the utilization of GSP programs and other trade preferences are all statistically significant at the 1% level (see columns [5] and [6]). In particular, among NonLDCs, WTO membership improves the utilization rate of other trade preferences by 20.4 percentage points (compared to non-WTO members), while it improves the utilization of GSP programs by 8.9 percentage points (compared to non-WTO members).

Results obtained from the FEDK-based regressions concerning the effect of WTO membership on the utilization of NRTPs (see *lines 10 and 11*) indicate for the full sample that WTO membership exerts no significant effect (at the conventional levels) on the usage of GSP programs (see column [1] of Table 2), but it exerts a negative and significant effect at the 1% level on the utilization of other trade preferences (see column [2] of Table 2). Thus, while WTO members experience the same utilization rate of GSP programs as non-WTO members, they have, on average, a lower utilization rate (by 6.6 percentage points) of other trade preferences compared to non-WTO members. The patterns of outcomes are different for LDCs. At the 1% level, WTO LDC members experience a lower utilization rate of GSP programs (i.e., by 11.7 percentage points) than non-WTO LDCs, whereas the utilization of other trade preferences is similar in both WTO LDC members and non-WTO LDC members. Finally, among NonLDCs and at the 1% level, WTO members have, on average, a higher utilization rate of GSP programs (i.e., by 13.6 percentage points) than non-WTO members, but a lower utilization rate of other trade preferences (i.e., by 12.6 percentage points) than non-WTO members.

Taking-up now the POLSDK-based outcomes concerning the effect of the duration of WTO membership on the utilization of NRTPs (see *lines 15 and 16* of Table 2), we obtain for the full sample that at the 1% level, the duration of WTO membership exerts a positive and significant effect on the utilization rate of both GSP programs and other trade preferences (see columns [1] and [2] of the Table). A one more year of the WTO membership is associated with an increase in the utilization rate of GSP programs by 0.66 percentage point, and a rise in the utilization rate of other trade preferences by 1.4 percentage point. These findings suggest that over the full sample, the duration of WTO membership exerts a higher positive effect on the utilization of other trade preferences than on that of GSP programs. In other words, as developing countries spend more time as WTO members, they tend to improve their utilization of other trade preferences at the expense of the usage of GSP programs. For LDCs, the effect of the duration of WTO membership on the utilization of other trade preference programs is significant only at the 10% level (see column [3] of Table 2), with an additional year of this membership being associated with a rise in the utilization rate of other trade preference programs by 0.86 percentage point, and with an increase in the usage rate of GSP programs by 0.6 percentage point. These outcomes suggest that

as the duration of their WTO membership increases, LDCs tend to make a better usage of GSP programs than of other trade preferences (see column [4] of Table 2).

Finally, for NonLDCs, the duration of WTO membership exerts a positive and significant effect (at the 1% level) on the utilization rate of the two blocks of NRTPs, with this effect being stronger on the utilization rate of other trade preferences than on that of GSP programs. Specially, an increase by one year of the duration of WTO membership induces a 1.6 percentage point rise in the utilization rate of other trade preferences (see column [6] of Table 2), but a 0.6 percentage point increase in the utilization rate of GSP programs (see column [5] of Table 2).

We now examine the results based on the FEDK estimator (see *lines 19 and 20* of Table 2) concerning the effect of the duration of WTO membership on the utilization of NRTPs. We find over the full sample that there is no difference between WTO members and non-WTO members in terms of the utilization rate of GSP programs. This is because the coefficient of the variable "NUMBWTO" is not significant at the conventional levels (see column [1] of the Table). Concurrently, over the full sample and at the 1% level, the WTO membership duration exerts a positive and significant effect on the utilization rate of other trade preferences, as an additional year of WTO membership increases the utilization rate of other trade preferences by 0.92 percentage point (see column [2] of the Table). For LDCs, there is no significant effect (at the conventional levels) of the elapsed time since a country had joined the WTO on the utilization rate of NRTPs (i.e., either GSP programs or other trade preferences) (see columns [3] and [4] of Table 2). The same conclusion applies to the effect of the duration of WTO membership on the utilization rate of GSP programs in NonLDCs (see column [5] of the Table). In contrast, for NonLDCs, and at the 1% level, an additional year of WTO membership induces an increase in the utilization rate of other trade preferences programs by **1.13** percentage point (see column [6] of the Table).

Concerning control variables in Tables 2a to 2d, we obtain, as expected, that beneficiary countries do not use GSP programs and other trade preferences in a complementary way, but rather in a substitutable way. This is because the coefficients of "UROTP" and "URGSP" are negative and significant at the 1% level across all columns of Tables 2a to 2d. In all these Tables, the real per capita income tends to exhibit a positive effect on the utilization of NRTPs, except in few instances such as in columns [5] and [6] of Tables 2a and 2c where its effect on NRTPs is negative. Across all these Tables, financial development tends to be negatively associated with the usage of NRTPs, although the effect of this variable is not always statistically significant. The negative effect of financial development on the utilization of NRTPs may reflect the fact that domestic banks tend to allocate credits to firms that export under MFN rates and not under preferential regimes. In all columns of Tables 2a to 2d, the variables "TERMS" (that represents terms of trade) and "POP" (which is the population size) exhibit coefficients that are alternatively positive or negative, while not being always statistically significant.

We now consider outcomes reported in Tables 3 and 4. In all columns of the two Tables, the coefficient of the one-period lag of the dependent variable is always positive and significant at the 1% level. This confirms the state dependence nature of the utilization rate of NRTPs, as also found by Gnanon and Iyer (2021). In addition, the outcomes of the diagnostic tests that help to check the validity of the two-step system GMM estimator (see the bottom of Tables 3 and 4) indicate that all GMM specifications presented in the two Tables pass the AR(1) and AR(2) tests as well as the Sargan test of over-identification. Furthermore, the p-values of the AR(3) test are

always higher than 0.10, thereby suggesting that the model specifications might not suffer from the omitted variable problem. Taking together, all these outcomes suggest that the two-step system GMM estimator is appropriate for undertaking the empirical analysis.

Let us interpret estimates in Table 3. The first two columns of this Table show that the coefficients of "WTO" are positive and significant at the 1% level, thereby suggesting that WTO membership contributes to fostering the utilization of both GSP programs and other trade preferences. WTO members beneficiaries of NRTPs experience a higher utilization of both types of NRTPs than non-WTO beneficiaries. In terms of magnitude, we note that WTO membership exerts a higher positive effect on the utilization rate of GSP programs than on the utilization rate of other trade preferences. **WTO members experience a higher (by 12.7 percentage point) utilization rate of GSP programs than non-WTO members, and a higher (by 8.2 percentage point) utilization rate of other trade preferences.** As noted above, these effects represent 'short term effects' as the long term effect (or medium term effect in the present analysis) of the WTO membership on the utilization rate of GSP programs and other trade preferences are respectively given by **39.8** [=  $12.7/(1-0.681)$ ] and **19.5** [=  $8.19/(1-0.579)$ ]. **These findings confirm our hypothesis 1 set out in section 3.**

Estimates related to control variables in columns [1] and [2] of Table 3 indicate that at the 1% level, an increase in the utilization of GSP programs results in a decrease in the usage of other trade preferences. This is exemplified by the negative and significant (at the 1% level) coefficients of the regressors "UROTP" and "URGSP" respectively in columns [1] and [2] of the Table 3. The improvement in the real per capita income is positively and significantly (at the 1% level) associated with the usage of the two blocks of NRTPs, although its effect is slightly stronger on the utilization of other trade preferences than on the utilization of GSP programs. Financial development exerts a negative and significant effect on the utilization rate of GSP programs, while it does not significantly influence the utilization of other trade preferences at the conventional levels. At the 1% level, terms of trade improvements and the rise in the population size affect positively the utilization rate of other trade preferences, while they exert no significant effect on the utilization rate of GSP programs.

Estimates in columns [3] and [4] of Table 3 suggest that WTO LDC members experience a lower utilization rate of the two blocks of NRTPs than WTO NonLDC members. At the 1% level, for LDCs and NonLDCs, the net effects of WTO membership on the utilization rate of GSP programs amount respectively to -0.16 (=  $16.12-16.28$ ) and +16.1. Meanwhile, at the 5% level, the net effect of WTO membership on the utilization of other trade preferences amount to 10.00 for both LDCs and NonLDCs. However, at the 10% level, for LDCs and NonLDCs, the net effects of WTO membership on the utilization rate of other trade preferences programs are respectively 2.7 (=  $10.00 - 7.28$ ) and 10.00. In a nutshell, results in columns [3] and [4] of Table 3 show that at the conventional significance levels, the effects of the WTO membership of LDCs on the utilization of the two blocks of NRTPs are far lower than the effect of the WTO membership of NonLDCs on the utilization of the two blocks of NRTPs. Moreover, WTO LDC members experience a lower utilization rate of GSP programs (i.e., by -0.16 percentage point - which is relatively small in terms of magnitude) than non-WTO LDC beneficiaries of these programs. At the same time, WTO LDC members enjoy a higher utilization rate of other trade preferences programs (i.e., by 2.7 percentage point) than non-WTO LDC beneficiaries of these preferences programs. Similarly, when joining the WTO, NonLDCs experience a higher utilization rate of GSP

programs (by 16.1 percentage points) and a higher utilization rate of other trade preferences (by 10 percentage points) than NonLDCs beneficiaries of these preferences that did not join the WTO.

Results in columns [5] and [6] of Table 3 indicate that among WTO members, those that joined the organization under Article XII experience a lower utilization rate of both GSP programs and other trade preferences than those that did not enter into the WTO under Article XII. For Article XII members, the net effects of WTO membership on the utilization rate of GSP programs and the utilization rate of other trade preferences amount respectively to 2.9 (= 25.49 - 22.58) and -3.9 (= 33.23 - 37.14). For non-Article XII members, the net effects of WTO membership on the utilization rate of GSP programs and the utilization rate of other trade preferences are respectively equal to 25.5 and 33.23. Overall, while Article XII members tend to make use of GSP programs and not of other trade preferences, non-Article XII members make a strong use of both GSP programs and other trade preferences, with the utilization rate of the latter being higher than the utilization rate of the former. These outcomes (like those of the four previous columns of Table 3 presented above) have the weaknesses of not taking into account the duration of WTO membership. These weaknesses are addressed in Table 4. Before turning to the interpretation of the estimates in Table 4, it is worth pointing out that the estimates of control variables in columns [3] to [6] of Table 3 are consistent with those reported in columns [1] and [2] of the same Table.

Let us now take up outcomes displayed in Table 4. Columns [1] and [2] of this Table indicate that the coefficients of "NUMBWTO" are positive and significant at the 1% level. These results show that **the duration of WTO membership exerts a positive effect on the utilization rate of each of the two blocks of NRTPs, with the magnitude of the effect on the utilization rate of other trade preferences almost doubling that of GSP programs. These findings support hypothesis 2 set out in section 3.** Thus, a one more year of WTO membership is associated with an increase in the utilization rate of GSP programs by 0.37 percentage point, and the utilization of other trade preferences by 0.6 percentage point. Meanwhile, we find from results in columns [3] and [4] of Table 4 that the effect of the duration of WTO membership on the utilization rates of both GSP programs and other trade preferences are lower in LDCs than in NonLDCs. This is exemplified by the fact that the coefficients of the interaction variable ["NUMBWTO\*LDC"] are negative and significant at the 1% level in columns [3] and [4] of Table 4. Hence, an increase by one year of the duration of WTO membership leads to an improvement in the utilization rate of GSP programs by 0.23 percentage point (= 0.478 - 0.251) and 0.48 percentage point respectively in LDCs and NonLDCs. Likewise, the net effects of the duration of WTO membership on the utilization rate of other trade preferences in LDCs and NonLDCs amount respectively to +0.036 (= 0.755 - 0.719) and +0.755. We conclude that an additional year of WTO membership leads to an increase in the utilization rate of other trade preferences by 0.036 percentage point in LDCs, and by 0.48 percentage point by NonLDCs, and a rise in the utilization rate of other trade preferences by 0.76 percentage point in LDCs (the effect is very small), and by **0.755** percentage point by NonLDCs. Taking together the findings from columns [3] and [4] of Table 4, **we can deduce that as they experience a higher duration of WTO membership, LDCs tend to make a far better usage of GSP programs than of other trade preferences programs, while NonLDCs use more other trade preferences than GSP programs.**

Outcomes reported in columns [5] and [6] of Table 4 show that Article XII members experience a lower effect of the duration of WTO membership on the utilization of NRTPs (both

GSP programs and other trade preferences) than non-Article XII members. This is exemplified by the negative and significant coefficients (at the 1% level) of the interaction variable ["NUMBWTO\*DUMART12"] in columns [5] and [6]. The net effects of the duration of WTO membership on the utilization rate of GSP programs for Article XII members and non-Article XII members amount respectively to **+0.05** (= 0.641 - 0.590) **and +0.64**. Similarly, the net effects of the duration of WTO membership on the utilization rate of other trade preferences programs for Article XII members and non-Article XII members are respectively equal to **+0.35 (= 0.760 - 0.407)** and **+0.760**. These outcomes suggest that **as the duration of their WTO membership increases, both Article XII members and non-Article XII members (regardless of whether there are LDCs or not) tend to make a greater utilization of other trade preferences than of GSP programs, even though the utilization rates of GSP programs and other trade preferences are higher for non-Article XII members than for Article XII members**. The effect of the duration of WTO membership on the utilization rate of GSP programs by LDCs is particularly small.

With some exceptions, estimates of control variables in Table 4 are in line with those reported in Table 3.

## 6. Further analysis

This section examines whether there exists a non-linear effect of the duration of WTO membership on the utilization of NRTPs. One may postulate that the benefits of WTO membership in terms of using NRTPs may take place after the first year of the entry into the WTO (of a country) and subsequently amplify as the duration of WTO membership increases, in particular if the incumbent country has been reforming its economic policies, and improving its institutional and governance quality during its accession process. In this scenario, the duration of WTO membership would induce a greater utilization of NRTPs (although possibly for some NRTPs at the expense of others), and this effect would amplify as the duration of WTO membership rises. This underlines the existence of a non-linear effect of the duration of WTO membership, whereby an additional year of WTO membership would more than enhance the utilization of NRTPs.

On the other side, it is arguable that the positive effect of WTO membership on the utilization of NRTPs (thanks, *inter alia*, to the implementation of better economic policies, of which trade policies, and the attraction of greater FDI flows) may take place after the member spent some years at the WTO. This is because it may take time for the new WTO member to implement the commitments undertaken when joining the WTO, and more generally WTO Agreements. Hence, the benefits in terms of the utilization of NRTPs might not materialize the first years of the membership, but only after some years of membership. It is, therefore, possible that the effect of the WTO membership duration on the utilization rate of NRTPs becomes positive after a number of years of membership. In this context, this effect could take the form of a U-curve, whereby the utilization rate of NRTPs would increase only after a number of years of WTO membership (i.e., as WTO member) for a given country.

To test the existence of a non-linear relationship between the duration of WTO membership and the utilization of NRTPs, we estimate (by means of the two-step system GMM approach) two different variants of models (1) and (2) that contain both the variable "NUMBWTO" (as the measure of the variable "VARINT") and its squared term. However, the squared term of the

variable "NUMBWTO" displays a highly skewed distribution and therefore needs to be transformed so as to mitigate the skewness of its distribution. At the same time, we could not transform the variable "NUMBWTO" directly using the natural logarithm because it contains '0' values. Therefore, rather than introducing directly the variable "NUMBWTO" and its squared term in the variants of models (1) and (2) described above, we introduce rather the variable "Log(NUMBWTO+0.001)", i.e., we add '0.001' to the variable "NUMBWTO" and apply the natural logarithm to the new variable obtained. Note that this approach helps to address the problem highlighted above, while also ensuring that the transformed variable (i.e., NUMBWTO+0.001) remains close to the variable "NUMBWTO". Note that the variable "NUMBWTO+0.001" is not really different from the variable "NUMBWTO" given that the latter is expressed in terms of years, and the constant '0.001' represents less than 1 day in a year.

The outcomes of the estimation of the above-mentioned two variants of models (1) and (2) are presented respectively in columns [1] and [2] of Table 5. We first note that in addition to the coefficients of the one-period lagged dependent variable being positive and significant at the 1% level, these two model specifications are correctly specified (see the outcomes of the diagnostic tests at the bottom of the Table).

Estimates concerning the control variables are in line with the ones reported in columns [1] and [2] of Table 4. With regard to our variables of interest, we note that in the two columns of Table 4, the coefficients of the variable ["Log(NUMBWTO+0.001)"] and those of its squared term are both positive and significant at the 1% level. These two outcomes indicate that there exists a non-linear effect of the duration of WTO membership on the utilization of NRTPs (GSP programs and other trade preferences), whereby a one more year of WTO membership does more than enhances the utilization of the NRTPs. Put it differently, the effect of the duration of WTO membership on the utilization of NRTPs is positive, and increases non-linearly (it amplifies) as the duration expands.

We illustrate this effect by presenting in Figure 6, at the 95 per cent confidence intervals, the marginal impact<sup>37</sup> of the duration of WTO membership on the utilization of GSP programs for every additional year of WTO membership. It appears that this marginal impact consistently increases as the time elapsed since the entry into the WTO increases, and is statistically significant only when it takes positive values, and when the number of years since the entry into the WTO exceeds the value of 0.0104 year = [exponential<sup>38</sup> (-4.477354) - 0.001], which is equivalent to 3.8 days. Hence, upon entry into the WTO, incumbent countries experience a positive effect of the WTO membership on the utilization of GSP programs, and the magnitude of this positive effect amplifies as the duration of membership increases.

Similarly, we provide in Figure 7, at the 95 per cent confidence intervals, the marginal impact of the duration of WTO membership on the utilization of other trade preference programs for every additional year of WTO membership. Here, the marginal impact is null when the variable "NUMBWTO" takes the value of 0.037 year = [exponential<sup>39</sup> (-3.262154) - 0.001], which is equivalent to 13.6 days. Hence, WTO membership induces a higher utilization of other trade

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<sup>37</sup> The marginal impacts that are statistically significant at the 95 per cent confidence intervals are delineated by those in the upper and lower bounds of the confidence interval that are either above or below the zero line.

<sup>38</sup> The coefficient "-4.477354" has been obtained from the software Stata, when constructing the graph displayed in Figure 6.

<sup>39</sup> The coefficient "-3.262154" has been obtained from the software Stata, when constructing the graph displayed in Figure 7.



preferences when the duration of the membership exceeds 13.6 days, and the magnitude of this positive effect increases further as the duration of the membership rises. Once again, the positive effect of the WTO membership on the utilization of other trade preferences takes immediately effect just after entry of a country into the WTO, and its magnitude increases (as the effect amplifies) as years pass.

## **7. Conclusion**

The present analysis has investigated the effect of WTO membership and the duration of this membership on the utilization of NRTPs, i.e., GSP programs and 'other trade preferences'. The analysis has covered a sample of 136 beneficiaries of NRTPs over the period 2002-2019. It has revealed that over the full sample, WTO members experience a higher utilization rate of both GSP programs and other trade preferences than non-WTO members, with the utilization rate of GSP programs being higher than that of other trade preferences. For both LDCs and NonLDCs, the membership in the WTO exerts a lower effect on the utilization of the two blocks of NRTPs. Additionally, WTO LDC members experience a lower utilization rate of GSP programs than non-WTO LDC beneficiaries of the same programs, but they enjoy a higher utilization rate of other trade preferences programs than non-WTO LDC beneficiaries of these preferences. As for NonLDCs, joining the WTO allow them to experience a higher utilization rate of the two blocks of NRTPs than NonLDCs beneficiaries of these preferences that are not WTO members. The utilization rate of GSP programs is higher than that of other trade preferences in NonLDCs. On another note, the greater the duration of WTO membership, the higher is the utilization rate of both GSP programs and other trade preferences, with the magnitude of the effect on the utilization rate of other trade preferences almost doubling the effect on the utilization of GSP programs.

The analysis has also shown that as their duration of WTO membership increases, LDCs tend to make a far better usage of GSP programs than of other trade preferences programs, while NonLDCs use more other trade preferences than GSP programs. Furthermore, the increase in the duration of WTO membership leads both Article XII members and non-Article XII members (regardless of whether there are LDCs or not) to make a greater utilization of other trade preferences than of GSP programs, although the utilization rates of GSP programs and other trade preferences are higher for non-Article XII members than for Article XII members.

Finally, the analysis has revealed that there is a non-linear positive effect of the duration of WTO membership on the utilization of both GSP programs and other trade preferences, whereby the positive effect takes place immediately after entry of a country into the WTO, and amplifies for every additional year spent as WTO member.

Overall, this analysis has contributed to the existing literature on the trade benefits of WTO membership, by showing that WTO membership exerts a strong positive effect on the utilization of GSP programs and other trade preferences, although this effect varies across sub-samples. In addition, and more importantly, the duration of WTO membership contributes strongly to improving the utilization of the two blocks of NRTPs over the full sample. This effect can vary across sub-sample and depends on the block of NRTPs considered, i.e., GSP programs and other trade preferences.

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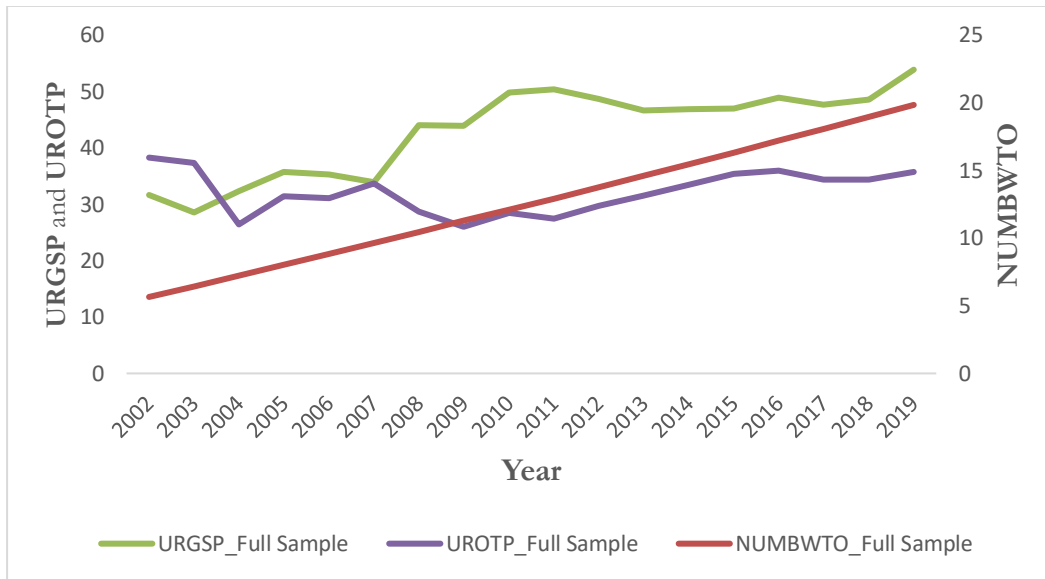
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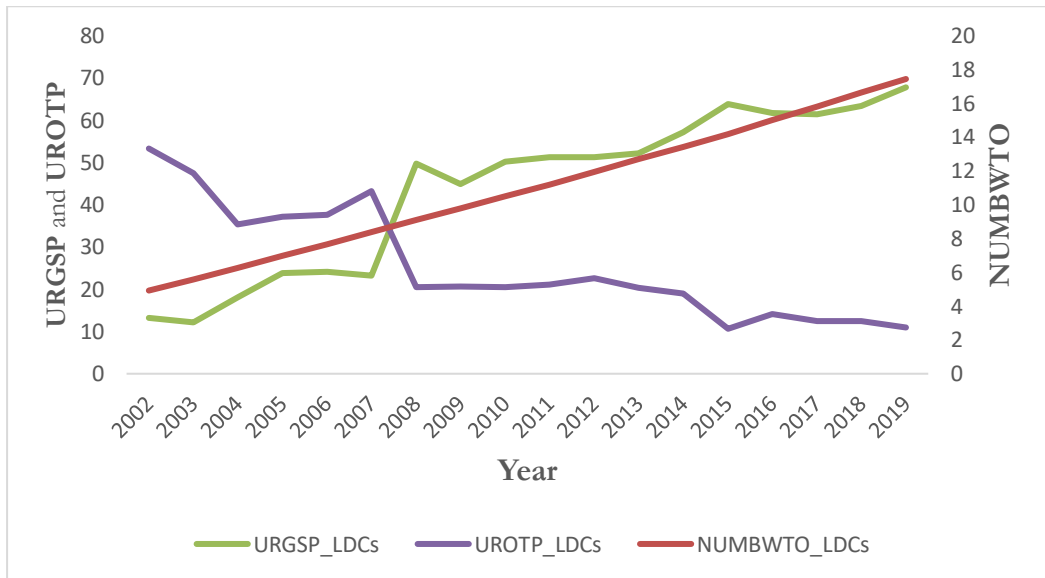
## FIGURES

**Figure 1:** Evolution over time of the utilization rate of trade preferences and countries' duration of WTO membership\_over the full sample



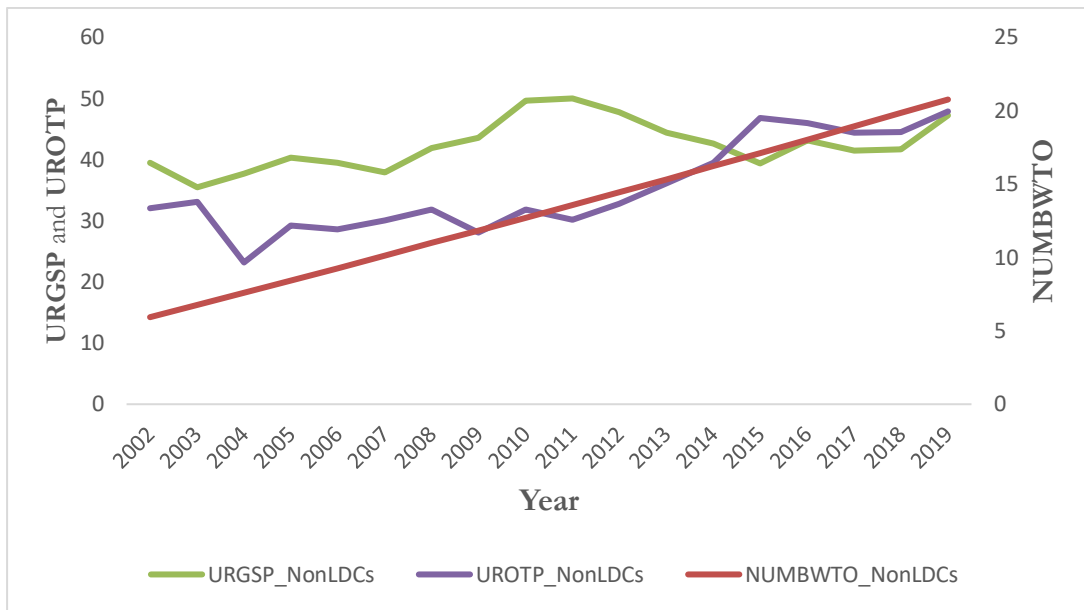
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**Figure 2:** Evolution over time of the utilization rate of trade preferences and countries' duration of WTO membership\_over the sub-sample of LDCs



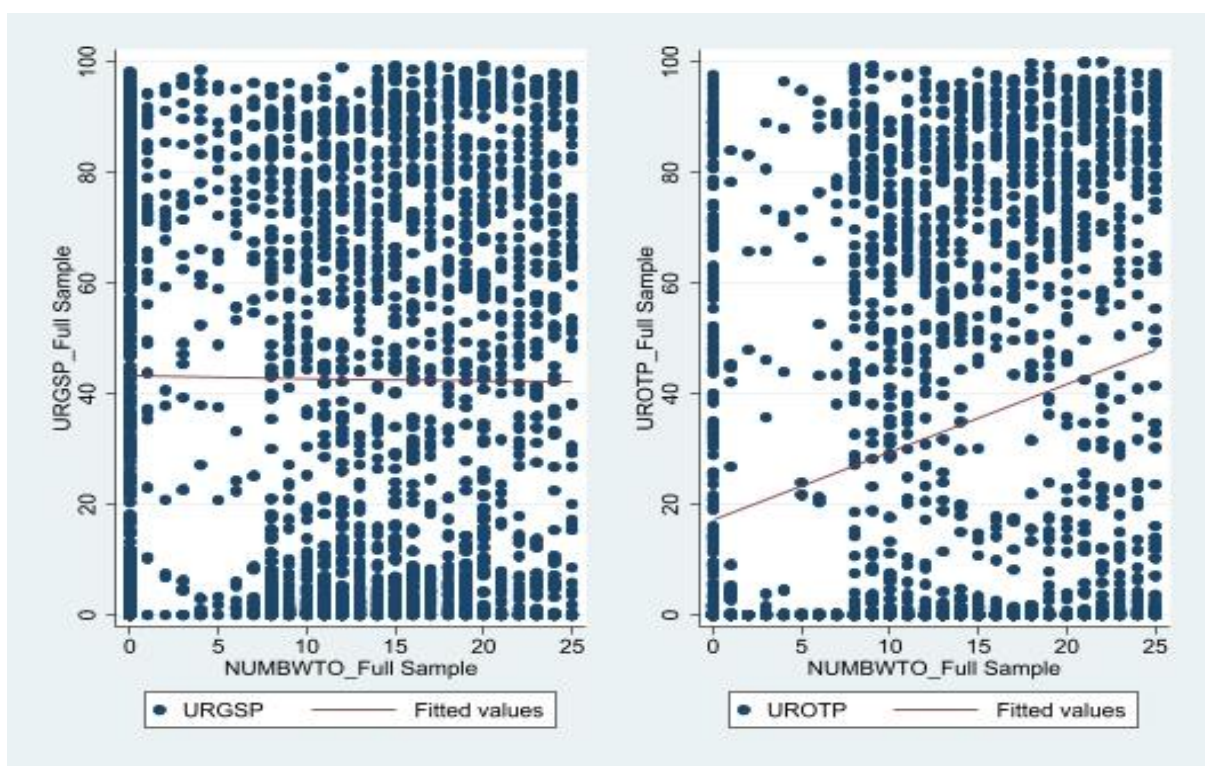
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**Figure 3:** Evolution over time of the utilization rate of trade preferences and countries' duration of WTO membership\_over the sub-sample of NonLDCs



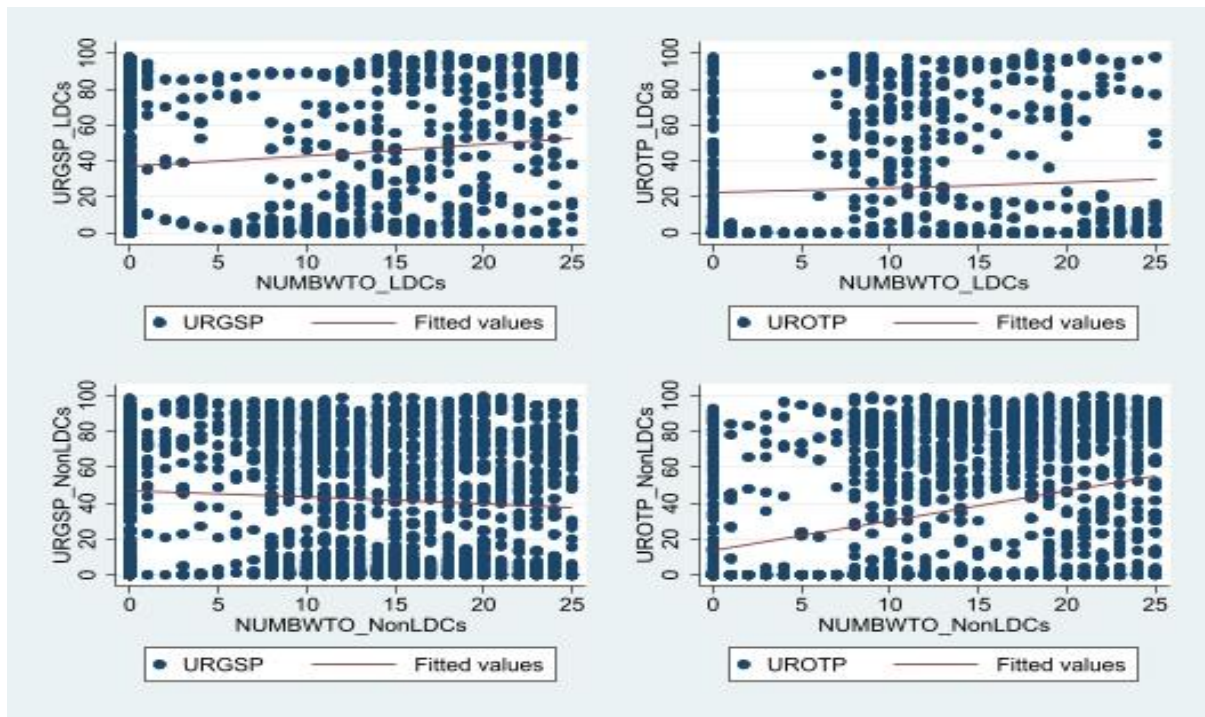
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**Figure 4:** Scatter plot between the utilization rate of trade preferences and countries' duration of WTO membership\_over the full sample



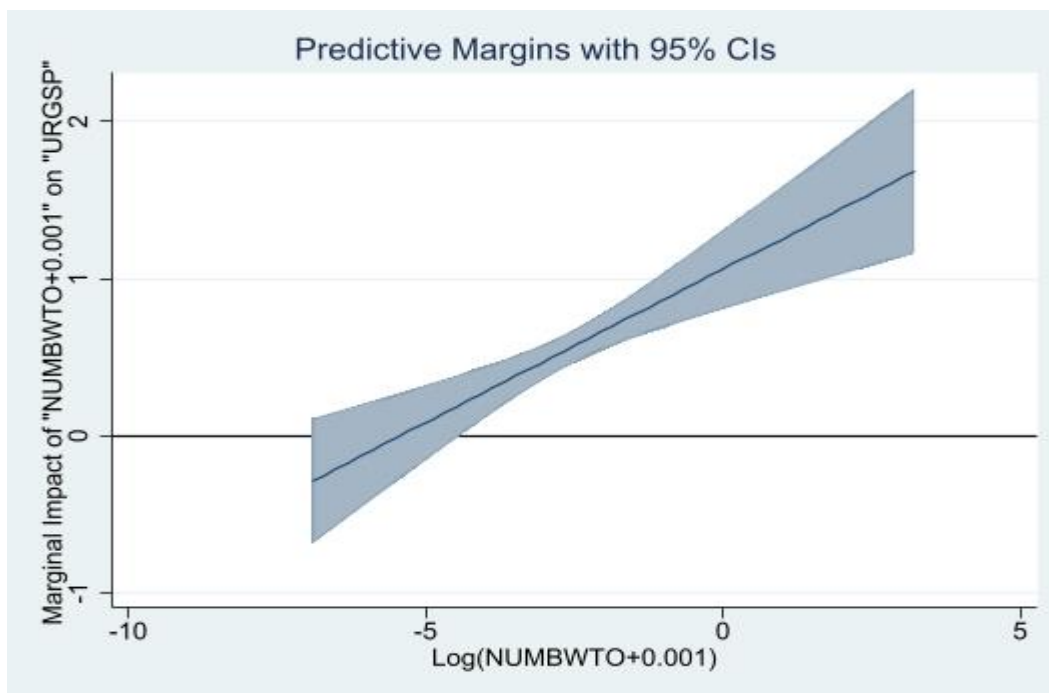
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**Figure 5:** Scatter plot between the utilization rate of trade preferences and countries' duration of WTO membership\_over the sub-samples of LDCs and NonLDCs



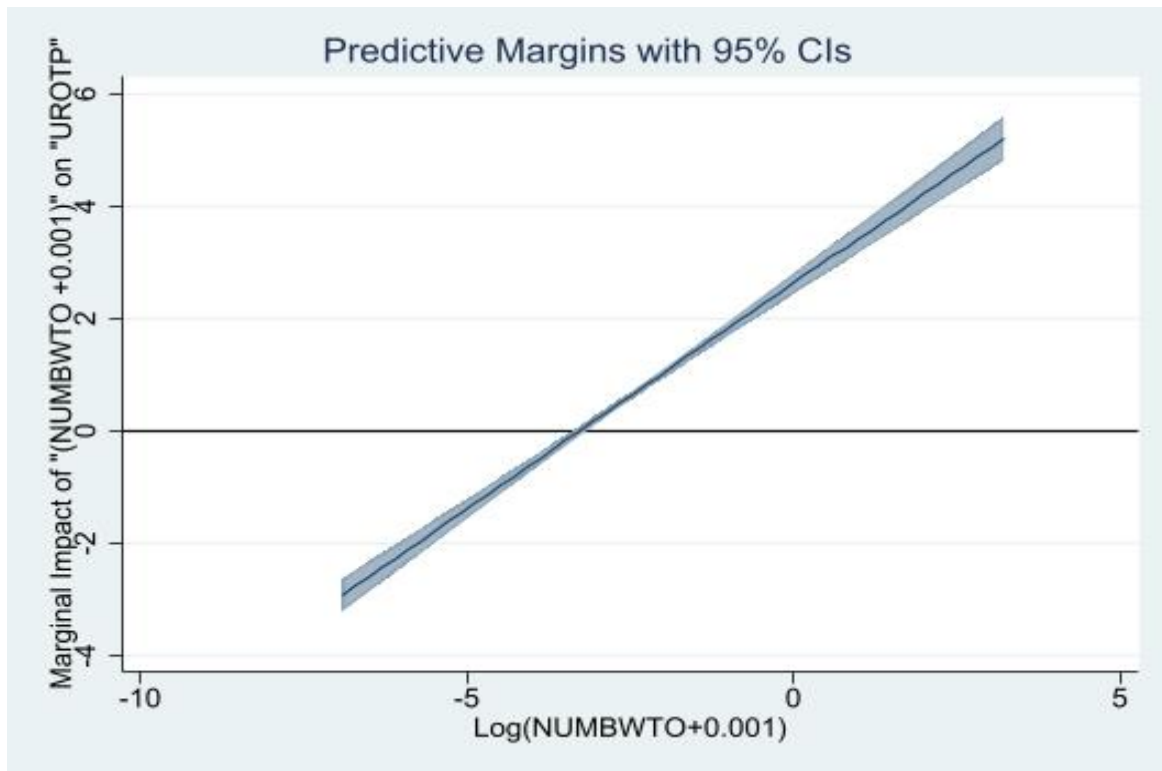
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**Figure 6:** Marginal Impact of the variable "NUMBWTO+0.001" on "UROGSP" on "URGSP", for varying number of years spent as WTO Members



Source: Author

**Figure 7:** Marginal Impact of the variable "NUMBWTO+0.001" on "UROTP", for varying number of years spent as WTO Members



Source: Author

## TABLES and APPENDICES

**Table 1:** Outcomes of the *Rank-sum tests* on the utilization of NRTPs variables

	Full sample	LDCs	NonLDCs
Distribution of:	(1)	(2)	(3)
	<b><i>Null Hypothesis: <math>URGSP(WTO==0) = URGDP(WTO==1)</math></i></b>		
URGSP	1.518 (0.1290)	0.479 (0.6322)	1.158 (0.2469)
	<b><i>Null Hypothesis: <math>Ho: UROTP(WTO==0) = UROTP(WTO==1)</math></i></b>		
UROTP	10.682 (0.0000)	- 6.625 (0.0000)	-8.038 (0.0000)

*Note: The null hypothesis for the Rank-sum test is that there is no difference in the distribution of the variables (i.e., "URGSP" for line 4, and "UROTP" for line 6) between WTO members and non-WTO members.  $\chi$ -statistics are reported, and their related p-values are provided in brackets.*

**Table 2:** Effect of WTO Membership and its duration on the utilization of NRTPs  
**Estimators:** POLSDK and FEDK

Variables	Full Sample		LDCs		NonLDCs	
	URGSP	UROTP	URGSP	UROTP	URGSP	UROTP
	(1)	(2)	(3)	(4)	(5)	(6)
<b><i>Effect of WTO membership on the utilisation of NRTPs</i></b>						
<b>Results of the regressions-based on the POLSDK estimator</b>						
<b>WTO</b>	8.993***	20.59***	7.100*	13.56***	8.899***	20.42***
	(2.179)	(2.781)	(3.575)	(3.273)	(2.287)	(3.781)
<b>Results of the regressions-based on the FEDK estimator</b>						
<b>WTO</b>	3.885	-6.577***	-11.70***	0.434	13.61***	-12.56***
	(4.122)	(2.478)	(4.248)	(3.369)	(4.244)	(2.325)
<b><i>Effect of duration of WTO membership on the utilisation of NRTPs</i></b>						
<b>Results of the regressions-based on the POLSDK estimator</b>						
<b>NUMBWTO</b>	0.664***	1.371***	0.859***	0.640***	0.569***	1.634***
	(0.0805)	(0.0844)	(0.0826)	(0.216)	(0.111)	(0.0851)
<b>Results of the regressions-based on the FEDK estimator</b>						
<b>NUMBWTO</b>	-0.149	0.922***	-0.216	0.0111	0.174	1.130***
	(0.356)	(0.282)	(0.583)	(0.626)	(0.417)	(0.311)

*Note: \*p-value<0.1; \*\*p-value<0.05; \*\*\*p-value<0.01. Robust Standard Errors are in parenthesis.*

**Table 3:** Effect of WTO Membership on the utilization of NRTPs\_Over the full sample  
*Estimator.* Two-Step System GMM

Variables	URGSP	UROTP	URGSP	UROTP	URGSP	UROTP
	(1)	(2)	(3)	(4)	(5)	(6)
One-period lag of the dependent variable	0.681***	0.579***	0.671***	0.570***	0.660***	0.567***
	(0.0220)	(0.0165)	(0.0206)	(0.0163)	(0.0224)	(0.0166)
WTO	12.67***	8.187***	16.12***	10.00***	25.49***	33.23***
	(2.011)	(1.952)	(3.802)	(2.828)	(8.179)	(4.134)
WTO*LDC			-16.28***	-7.280*		
			(4.893)	(3.922)		
WTO*DUMART12					-22.58**	-37.14***
					(8.996)	(4.635)
LDC			11.64***	-10.04**		
			(4.398)	(3.976)		
DUMART12					25.17***	33.26***
					(7.562)	(4.249)
UROTP	-0.349***		-0.359***		-0.364***	
	(0.0249)		(0.0242)		(0.0248)	
URGSP		-0.276***		-0.275***		-0.267***
		(0.0134)		(0.0131)		(0.0139)
Log(GDPC)	3.604***	4.141***	2.334*	-2.438**	2.757***	4.153***
	(0.745)	(0.557)	(1.360)	(1.174)	(0.844)	(0.609)
FINDEV	-15.62***	2.709	-16.11***	1.584	-12.50***	0.565
	(4.151)	(2.591)	(4.312)	(2.330)	(4.409)	(2.331)
TERMS	0.00211	0.0493***	0.00824	0.0513***	0.00290	0.0416***
	(0.0118)	(0.0123)	(0.0125)	(0.0132)	(0.0114)	(0.0126)
Log(POP)	1.439	2.073***	1.376	2.083***	1.262	2.158***
	(0.905)	(0.530)	(0.931)	(0.477)	(0.862)	(0.532)
Constant	-28.64	-54.00***	-19.32	3.175	-30.94	-76.81***
	(18.66)	(8.994)	(23.15)	(12.34)	(21.86)	(10.41)
Observations/Countries	2,070/136	2,070/136	2,070/136	2,070/136	2,070/136	2,070/136
AR1 (P-Value)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
AR2 (P-Value)	0.6584	0.2877	0.6573	0.2852	0.6829	0.2574
AR3 (P-Value)	0.9936	0.7627	0.9809	0.7785	0.9674	0.7628
Sargan (P-Value)	0.1070	0.1576	0.10	0.2021	0.10	0.1386

Note: \*p-value<0.1; \*\*p-value<0.05; \*\*\*p-value<0.01. Robust standard errors are in parenthesis. Time dummies have been included in the regressions.



**Table 4:** Effect of the duration of WTO Membership on the utilization of NRTPs\_Over the full sample

*Estimator.* Two-Step System GMM

Variables	URGSP	UROTP	URGSP	UROTP	URGSP	UROTP
	(1)	(2)	(3)	(4)	(5)	(6)
One-period lag of the dependent variable	0.633***	0.579***	0.613***	0.540***	0.626***	0.604***
	(0.0147)	(0.00996)	(0.0111)	(0.00794)	(0.0101)	(0.00764)
NUMBWTO	0.374***	0.599***	0.478***	0.755***	0.641***	0.760***
	(0.0605)	(0.0546)	(0.0630)	(0.0661)	(0.0515)	(0.0532)
NUMBWTO*LDC			-0.251***	-0.719***		
			(0.0834)	(0.0618)		
NUMBWTO*DUMART12					-0.590***	-0.407***
					(0.0808)	(0.0724)
LDC			-13.45***	-14.29***		
			(2.197)	(1.954)		
DUMART12					11.92***	7.331***
					(1.025)	(0.898)
UROTP	-0.362***		-0.383***		-0.355***	
	(0.0167)		(0.0110)		(0.0165)	
URGSP		-0.286***		-0.304***		-0.255***
		(0.00761)		(0.0106)		(0.00814)
Log(GDPC)	-0.239	2.724***	-5.350***	-9.153***	-1.456***	2.181***
	(0.633)	(0.414)	(0.960)	(0.872)	(0.423)	(0.376)
FINDEV	-14.76***	-2.898*	-17.43***	-2.193	-13.53***	-0.326
	(2.792)	(1.636)	(2.176)	(1.446)	(1.810)	(1.334)
TERMS	0.00297	0.0496***	0.00380	0.0543***	0.000911	0.0592***
	(0.00823)	(0.00918)	(0.00743)	(0.00710)	(0.00702)	(0.00818)
Log(POP)	1.101*	1.250***	-0.333	1.979***	1.123***	1.298***
	(0.611)	(0.378)	(0.490)	(0.255)	(0.294)	(0.307)
Constant	16.77	-29.07***	75.68***	62.66***	20.24***	-34.15***
	(11.12)	(6.023)	(13.48)	(8.111)	(4.569)	(5.743)
Observations/Countries	2,070/136	2,070/136	2,070/136	2,070/136	2,070/136	2,070/136
Number of Instruments	115	115	133	133	133	133
AR1 (P-Value)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
AR2 (P-Value)	0.6895	0.2871	0.7009	0.2639	0.6875	0.2911
AR3 (P-Value)	0.9701	0.7441	0.9689	0.7551	0.9768	0.7663
Sargan (P-Value)	0.2507	0.10	0.3578	0.1224	0.1589	0.1563

Note: \*p-value<0.1; \*\*p-value<0.05; \*\*\*p-value<0.01. Robust Standard Errors are in parenthesis. Time dummies have been included in the regressions.

**Table 5:** Non-linear effect of the duration of WTO Membership on the utilization of NRTPs\_Over the full sample

*Estimator:* Two-Step System GMM

Variables	URGSP	UROTP
	(1)	(2)
One-period lag of the dependent variable	0.653***	0.593***
	(0.0101)	(0.00737)
Log(NUMBWTO+0.001)	1.058***	2.620***
	(0.129)	(0.0943)
[Log(NUMBWTO+0.001)] <sup>2</sup>	0.0976***	0.401***
	(0.0227)	(0.0169)
UROTP	-0.353***	
	(0.0116)	
URGSP		-0.260***
		(0.00655)
Log(GDPC)	1.694***	3.127***
	(0.243)	(0.325)
FINDEV	-10.99***	0.480
	(1.141)	(0.945)
TERMS	-0.00434	0.0420***
	(0.00558)	(0.00710)
Log(POP)	-0.150*	0.527***
	(0.0825)	(0.0856)
Constant	11.79***	-21.29***
	(1.482)	(3.104)
Observations/Countries	2,070/136	2,070/136
Number of Instruments	133	133
AR1 (P-Value)	0.0000	0.0000
AR2 (P-Value)	0.6749	0.2789
AR3 (P-Value)	0.9825	0.7801
Sargan (P-Value)	0.2110	0.2536

Note: \*p-value<0.1; \*\*p-value<0.05; \*\*\*p-value<0.01. Robust Standard Errors are in parenthesis. Time dummies have been included in the regressions.

**Appendix 1: Definition and Source of variables**

Variables	Definition	Source
URGSP	<p>This is the indicator of the utilization rate of unilateral trade preferences under the Generalized System of Preferences (GSP) schemes 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 that are eligible for trade preferences are actually imported under these preferences (e.g., WTO, 2016).</p> <p>This indicator has been computed using a formula adopted both by the WTO (see WTO, 2016) and the UNCTAD and which goes as follows:</p> $\text{URGSP} = 100 * (\text{GSP Received Imports}) / (\text{GSP Covered Imports}),$ <p>where "GSP received imports" refers to the value of imports that received GSP treatment, and "GSP covered imports" indicates the value of imports that are classified in tariff lines that are dutiable and covered by the GSP scheme of the preference-granting country. Detailed information on the dataset is available over the Internet at: <a href="https://gsp.unctad.org/about">https://gsp.unctad.org/about</a></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>United Nations Conference on Trade and Development (UNCTAD) Dataset: <a href="https://gsp.unctad.org/utilization">https://gsp.unctad.org/utilization</a></p>
UROTP	<p>This is the indicator of the utilization rate of the other trade preferences than the GSP programs provided by the QUAD countries to developing countries, including least-developed countries among them. In particular, it covers preferences granted by USA under the African Growth and Opportunity Act (AGOA) and the Caribbean Basin Initiative; in the case of the European Union, it includes preferences under the Economic Partnership Agreements (EPAs) entered with selected Africa Sub-Saharan countries.</p> <p>This indicator has been calculated using a formula similar to the one used to compute the indicator "USGSP". The formula goes as follows:</p> $\text{UROTP} = 100 * (\text{Other-Preferential Imports}) / (\text{Other Preferential Covered Imports}),$ <p>where "Other-Preferential Imports" refers to the value of imports that benefitted from NRTPs other than GSP and under selected Economic Partnership Agreements that the EU has entered with some African countries.</p> <p>"Other-Preferential Covered Imports" refers to the value of imports that are classified in tariff lines that are dutiable and covered by the other-preferential schemes.</p> <p>Detailed information on the dataset is available over the Internet at: <a href="https://gsp.unctad.org/about">https://gsp.unctad.org/about</a></p>	<p>United Nations Conference on Trade and Development (UNCTAD) Dataset: <a href="https://gsp.unctad.org/utilization">https://gsp.unctad.org/utilization</a></p>

	Values of the indicator "UROTP" range between 0 and 100, with higher values indicating a greater utilization rate of other trade preferences programs	
NUMBWTO	This is a country's duration of WTO membership. For a given country, it represents the time elapsed since the country has joined the WTO. This variable takes the value of "0" for years during which the country was not a WTO Member. It takes the value of 1 the first year the country had become a WTO Member (i.e., the year it acceded to the WTO), and is incremented by 1 for every subsequent (additional) year. Note that for any country that had joined the WTO before 2002 (which is the first year of the period under analysis), the value of "1" has been attributed to the year (i.e., between 1995 and 2002) during which the country had acceded to the WTO, and then incremented by "1" for every additional year, until the last year of the period under analysis. For example, for countries that joined the WTO in 1995, the variable "NUMBWTO" takes the value of "1" in 1995, and hence "8" in 2002, "9" in 2003,...and "25" in 2019. For a given country, the higher the value of the indicator "NUMBWTO", the greater the duration of the WTO membership.	Author's computation based on data on WTO Membership extracted from the WTO's website ( <a href="https://www.wto.org/english/thewto_e/whatis_e/tif_e/org6_e.htm">https://www.wto.org/english/thewto_e/whatis_e/tif_e/org6_e.htm</a> )
GDP	Gross Domestic Product (constant 2010 US\$).	World Development Indicators (WDI), 2021
POP	This is the measure of the total Population	WDI, 2021
TERMS	This is the indicator of the TERMS of trade, measured by the net barter TERMS of trade index (2000 = 100).	WDI, 2021
FINDEV	This is the indicator of financial development. It is measured by the share (%) of domestic credit to the private sector in GDP. Missing values have been replaced by the values of the share (%) of the domestic credit offered by banks to the private sector in GDP. For easing results' interpretation, we have re-scaled this variable (i.e., by dividing it by 100).	Author's calculation based on data from WDI, 2021

**Appendix 2:** Descriptive statistics on variables used in the analysis

Variable	Observations	Mean	Standard deviation	Minimum	Maximum
URGSP	1,673	45.368	35.160	0.000	99.370
UROTP	1,673	33.095	37.886	0.000	100.000
WTO	1,673	0.852	0.355	0.000	1.000
NUMBWTO	1,673	14.075	7.720	0	25
GDPG	1,673	6406.447	8304.122	208.075	59374.440
FINDEV	1,673	0.409	0.334	0.020	2.332
TERMS	1,673	125.060	46.147	46.276	458.575
POP	1,673	45,000,000	168,000,000	70718	1,390,000,000

**Appendix 3:** List of countries contained in the full sample and the sub-sample of LDCs

Full sample				LDCs	
Afghanistan	Croatia	Korea, Rep.	Portugal	Afghanistan	Uganda
Albania	Cyprus	Kuwait	Romania	Angola	Vanuatu
Algeria	Czech Republic	Kyrgyz Republic	Russian Federation	Bangladesh	Yemen, Rep.
Angola	Dominica	Lao PDR	Rwanda	Benin	
Argentina	Dominican Republic	Lesotho	Samoa	Bhutan	
Armenia	Ecuador	Liberia	Sao Tome and Principe	Burkina Faso	
Azerbaijan	Egypt, Arab Rep.	Libya	Saudi Arabia	Burundi	
Bahamas, The	El Salvador	Madagascar	Senegal	Cambodia	
Bahrain	Equatorial Guinea	Malawi	Seychelles	Central African Republic	
Bangladesh	Eritrea	Malaysia	Sierra Leone	Chad	
Barbados	Estonia	Maldives	Singapore	Comoros	
Belarus	Eswatini	Mali	Slovak Republic	Eritrea	
Belize	Ethiopia	Malta	Slovenia	Ethiopia	
Benin	Fiji	Mauritania	Solomon Islands	Gambia, The	
Bhutan	Gabon	Mauritius	South Africa	Guinea	
Bolivia	Gambia, The	Mexico	Sri Lanka	Guinea-Bissau	
Botswana	Georgia	Moldova	St. Vincent and the Grenadines	Lao PDR	
Brazil	Ghana	Mongolia	Sudan	Lesotho	
Brunei Darussalam	Greece	Morocco	Suriname	Liberia	
Bulgaria	Guatemala	Mozambique	Tajikistan	Madagascar	
Burkina Faso	Guinea	Namibia	Tanzania	Malawi	
Burundi	Guinea-Bissau	Nepal	Thailand	Mali	
Cabo Verde	Guyana	Nicaragua	Togo	Mauritania	
Cambodia	Honduras	Niger	Tonga	Mozambique	
Cameroon	Hong Kong SAR, China	Nigeria	Trinidad and Tobago	Nepal	
Central African Republic	Hungary	North Macedonia	Tunisia	Niger	
Chad	India	Oman	Turkey	Rwanda	
Chile	Indonesia	Pakistan	Uganda	Sao Tome and Principe	

China	Iran, Islamic Rep.	Panama	Ukraine	Senegal	
Colombia	Israel	Papua New Guinea	Uruguay	Sierra Leone	
Comoros	Jamaica	Paraguay	Uzbekistan	Solomon Islands	
Congo, Rep.	Jordan	Peru	Vanuatu	Sudan	
Costa Rica	Kazakhstan	Philippines	Venezuela, RB	Tanzania	
Cote d'Ivoire	Kenya	Poland	Yemen, Rep.	Togo	

**Appendix 4:** Duration of the WTO membership as at 2019 (end-year of the period under analysis)

Country	Duration of Membership in 2019	Country	Duration of Membership in 2019	Country	Duration of Membership in 2019	Country	Duration of Membership in 2019
Afghanistan**	4	Croatia**	20	Korea, Rep.	25	Portugal	25
Albania**	20	Cyprus	25	Kuwait	25	Romania	25
Algeria	0	Czech Republic	25	Kyrgyz Republic**	22	Russian Federation**	8
Angola	25	Dominica	25	Lao PDR**	1	Rwanda	23
Argentina	25	Dominican Republic	25	Lesotho	25	Samoa**	8
Armenia**	17	Ecuador**	24	Liberia**	4	Sao Tome and Principe	0
Azerbaijan	0	Egypt	25	Libya	0	Saudi Arabia**	15
Bahamas	0	El Salvador	25	Madagascar	25	Senegal	25
Bahrain	25	Equatorial Guinea	0	Malawi	25	Seychelles**	5
Bangladesh	25	Eritrea	0	Malaysia	25	Sierra Leone	25
Barbados	25	Estonia**	21	Maldives	25	Singapore	25
Belarus	0	Eswatini	25	Mali	25	Slovak Republic	25
Belize	25	Ethiopia	0	Malta	25	Slovenia	25
Benin	24	Fiji	25	Mauritania	25	Solomon Islands	23
Bhutan	0	Gabon	25	Mauritius	25	South Africa	25
Bolivia	25	Gambia	23	Mexico	25	Sri Lanka	25
Botswana	25	Georgia**	20	Moldova**	19	St. Vincent and the Grenadines	25
Brazil	25	Ghana	25	Mongolia**	23	Sudan	0
Brunei Darussalam	25	Greece	25	Morocco	25	Suriname	25
Bulgaria**	24	Guatemala	25	Mozambique	25	Tajikistan**	7
Burkina Faso	25	Guinea	25	Namibia	25	Tanzania	25
Burundi	25	Guinea-Bissau	25	Nepal**	16	Thailand	25
Cabo Verde**	12	Guyana	25	Nicaragua	25	Togo	25
Cambodia**	16	Honduras	25	Niger	23	Tonga	13
Cameroon	25	Hong Kong SAR, China	25	Nigeria	25	Trinidad and Tobago	25
Central African Republic	25	Hungary	25	North Macedonia**	17	Tunisia	25
Chad	24	India	25	Oman**	20	Turkey	25
Chile	25	Indonesia	25	Pakistan	25	Uganda	25

China**	19	Iran	0	Panama**	22	Ukraine**	1
Colombia	25	Israel	25	Papua New Guinea	23	Uruguay	25
Comoros	0	Jamaica	25	Paraguay	25	Uzbekistan	0
Congo, Rep.	25	Jordan**	20	Peru	25	Vanuatu**	8
Costa Rica	25	Kazakhstan**	5	Philippines	25	Venezuela, RB	25
Cote d'Ivoire	25	Kenya	25	Poland	25	Yemen, Rep**	6

*Note: Countries for which the duration of WTO membership is '0' in 2019 are de-facto non-WTO Members. '\*\*' refers to Article XII WTO member states.*



## OTHER TABLES

**Table 2a:** Effect of WTO Membership on the utilization of NRTPs  
*Estimator.* POLSDK

Variables	Full Sample		LDCs		NonLDCs	
	URGSP	UROTP	URGSP	UROTP	URGSP	UROTP
	(1)	(2)	(3)	(4)	(5)	(6)
WTO	8.993*** (2.179)	20.59*** (2.781)	7.100* (3.575)	13.56*** (3.273)	8.899*** (2.287)	20.42*** (3.781)
UROTP	-0.504*** (0.0366)		-0.571*** (0.0322)		-0.504*** (0.0412)	
URGSP		-0.565*** (0.0414)		-0.560*** (0.0417)		-0.612*** (0.0452)
Log(GDPC)	-0.866 (1.236)	0.228 (1.064)	17.42*** (2.583)	16.20*** (2.696)	-8.077*** (1.278)	-8.546*** (0.859)
FINDEV	-5.035 (4.333)	-10.46** (4.441)	24.37* (13.22)	-42.81*** (7.139)	-5.163 (3.263)	-5.230 (4.714)
TERMS	0.0759*** (0.0208)	0.0386 (0.0282)	-0.0780 (0.0552)	-0.165*** (0.0188)	0.0971*** (0.0143)	0.0767** (0.0365)
Log(POP)	2.236*** (0.376)	-0.334 (0.402)	6.186*** (0.700)	3.472*** (1.024)	1.376*** (0.333)	-1.371*** (0.251)
Constant	15.69 (12.86)	42.30** (16.45)	-158.4*** (17.54)	-97.00*** (33.25)	90.79*** (11.29)	131.8*** (7.341)
Observations/Countries	2,201/136	2,201/136	619/37	619/37	1,582/99	1,582/99
Number of groups	136	136	37	37	99	99
R-squared	0.321	0.323	0.447	0.415	0.368	0.357

Note: \**p*-value<0.1; \*\**p*-value<0.05; \*\*\**p*-value<0.01. Robust Standard Errors are in parenthesis.

**Table 2b:** Effect of WTO Membership on the utilization of NRTPs  
*Estimator.* FEDK

Variables	Full Sample		LDCs		NonLDCs	
	URGSP	UROTP	URGSP	UROTP	URGSP	UROTP
	(1)	(2)	(3)	(4)	(5)	(6)
WTO	3.885 (4.122)	-6.577*** (2.478)	-11.70*** (4.248)	0.434 (3.369)	13.61*** (4.244)	-12.56*** (2.325)
UROTP	-0.529*** (0.0425)		-0.632*** (0.108)		-0.413*** (0.0435)	
URGSP		-0.442*** (0.0294)		-0.651*** (0.0313)		-0.283*** (0.0342)
Log(GDPC)	15.98*** (3.747)	27.02*** (2.868)	51.15*** (7.142)	59.94*** (14.97)	5.379 (3.817)	21.14*** (4.072)
FINDEV	-12.75** (5.501)	-4.251 (3.380)	-19.67*** (6.527)	-33.05** (14.05)	-11.98* (6.994)	0.0407 (3.248)
TERMS	0.0217 (0.0288)	0.00631 (0.0281)	0.0808** (0.0381)	0.0650 (0.0622)	0.0240 (0.0315)	-0.0263 (0.0295)
Log(POP)	56.47***	-7.446	39.77***	-46.92***	42.84***	39.03***

	(8.595)	(6.070)	(10.37)	(14.03)	(8.678)	(4.806)
Constant	-961.4***	-42.93	-908.9***	392.9**	-674.1***	-736.1***
	(116.6)	(92.19)	(162.6)	(153.9)	(116.9)	(67.97)
Observations/Countries	2,201/136	2,201/136	619/37	619/37	1,582/99	1,582/99
Within R-squared	0.3272	0.2697	0.6519	0.5741	0.1514	0.1924

Note: \*p-value<0.1; \*\*p-value<0.05; \*\*\*p-value<0.01. Robust Standard Errors are in parenthesis.

**Table 2c:** Effect of countries' duration of WTO Membership on the utilization of NRTPs  
*Estimator.* POLSDK

Variables	Full Sample		LDCs		NonLDCs	
	URGSP	UROTP	URGSP	UROTP	URGSP	UROTP
	(1)	(2)	(3)	(4)	(5)	(6)
NUMBWTO	0.664***	1.371***	0.859***	0.640***	0.569***	1.634***
	(0.0805)	(0.0844)	(0.0826)	(0.216)	(0.111)	(0.0851)
UROTP	-0.523***		-0.566***		-0.528***	
	(0.0352)		(0.0318)		(0.0414)	
URGSP		-0.565***		-0.588***		-0.584***
		(0.0422)		(0.0442)		(0.0477)
Log(GDPC)	-0.699	0.516	17.21***	15.77***	-8.344***	-8.436***
	(1.233)	(0.942)	(2.545)	(2.653)	(1.301)	(0.674)
FINDEV	-6.563*	-12.92***	23.61**	-40.62***	-6.093*	-9.287**
	(3.864)	(3.967)	(10.46)	(6.359)	(3.299)	(3.971)
TERMS	0.0593***	0.00391	-0.0824	-0.182***	0.0823***	0.0323
	(0.0185)	(0.0246)	(0.0545)	(0.0240)	(0.0136)	(0.0254)
Log(POP)	2.075***	-0.552*	5.324***	3.745***	1.203***	-1.756***
	(0.345)	(0.279)	(0.584)	(0.930)	(0.324)	(0.198)
Constant	19.41	48.76***	-147.3***	-92.91***	99.40***	140.0***
	(13.16)	(14.93)	(18.72)	(32.61)	(12.48)	(5.993)
Observations/Countries	2,201/136	2,201/136	619/37	619/37	1,582/99	1,582/99
R-squared	0.331	0.358	0.474	0.411	0.373	0.420

Note: \*p-value<0.1; \*\*p-value<0.05; \*\*\*p-value<0.01. Robust Standard Errors are in parenthesis.

**Table 2d:** Effect of countries' duration of WTO Membership on the utilization of NRTPs  
*Estimator.* FEDK

Variables	Full Sample		LDCs		NonLDCs	
	URGSP	UROTP	URGSP	UROTP	URGSP	UROTP
	(1)	(2)	(3)	(4)	(5)	(6)
NUMBWTO	-0.149	0.922***	-0.216	0.0111	0.174	1.130***
	(0.356)	(0.282)	(0.583)	(0.626)	(0.417)	(0.311)
UROTP	-0.529***		-0.638***		-0.433***	
	(0.0386)		(0.107)		(0.0485)	
URGSP		-0.436***		-0.652***		-0.290***
		(0.0301)		(0.0294)		(0.0375)
Log(GDPC)	17.78***	17.33***	53.13***	59.88***	5.525	6.220
	(5.869)	(3.254)	(7.044)	(14.35)	(6.550)	(6.272)
FINDEV	-11.15***	-11.17**	-23.79***	-32.92*	-11.46**	-8.742*

	(4.146)	(4.713)	(8.433)	(17.90)	(5.628)	(4.873)
TERMS	0.0196	0.0122	0.0807**	0.0651	0.0184	-0.0178
	(0.0287)	(0.0307)	(0.0365)	(0.0710)	(0.0305)	(0.0307)
Log(POP)	60.78***	-31.71***	42.57***	-47.10	40.53***	7.702
	(10.61)	(11.15)	(12.65)	(31.01)	(9.754)	(6.761)
Constant	-1,039***	402.9**	-971.8***	396.3	-628.2***	-135.5
	(181.6)	(189.6)	(180.9)	(406.2)	(174.2)	(148.8)
Observations/Countries	2,201/136	2,201/136	619/37	619/37	1,582/99	1,582/99
Number of groups	136	136	37	37	99	99
Within R-squared	0.3269	0.2789	0.6489	0.5741	0.1438	0.2046

Note: \**p*-value<0.1; \*\**p*-value<0.05; \*\*\**p*-value<0.01. Robust Standard Errors are in parenthesis.