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PREFERENTIAL TARIFFS FOR DEVELOPING COUNTRIES: DID THEY FOSTER AGRICULTURAL EXPORTS TO SWITZERLAND?

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Abstract

We analyse the Swiss import structure of the agricultural and food sector from developing countries (DCs) and least-developed countries (LDCs) which benefit from the Generalised System of Preferences (GSP). Between 2002 and 2011, 46% and 36% of the agricultural products from the DCs and LDCs, respectively, were imported under the GSP scheme. However, most of the agricultural products from DCs and LDCs entered Switzerland under a most favoured nations (MFN) of zero. The estimations of a gravity model underpin the findings of the descriptive analysis: Being simultaneously a member of the WTO and in the GSP scheme fosters agro-food imports from DCs and LDCs significantly. Furthermore, the productivity and supply capacity within the agricultural sector depicted by the agriculture gross domestic product of a trading partner has a strong and significant positive effect on imports.

Key words**:** *agriculture and food trade, developing countries, gravity model, GSP*

INTRODUCTION

The ability of foreign aid to promote economic and social development is nowadays called into question. A bulk of theoretical and empirical literature in development economics finds that foreign aid is ineffective. [31] In this context preferential trade agreements like the Generalised System of Preferences (GSP) have become more and more important for the developing countries (DCs) and least-developed countries (LDCs) to reduce poverty and spur economic development. Since March 1st 1972 Switzerland has granted, like the USA, the EU, Canada and Japan, on a voluntary and non-reciprocal basis[7] preferential tariffs for DCs and the LDCs for industrial and agricultural products. The DCs and the LDCs are not charged – depending on the product – any tariffs or enjoy reduced tariffs for their exports to Switzerland. Since April 1st 2007 the imports of agricultural and food products from the LDCs have been in general duty-free, quota-free (DFQF) and are not bounded by seasonal restrictions[8]. Imports of agro-food products from DCs have been – depending on the product - possible with a lower tariff or duty-free. However, DCs are still bound by quotas.

The agricultural and food sector plays an important role for many of those countries. After the introduction of the GSP in 1968, many authors praised the positive effect of the GSP in subsequent years. [5; 23; 7] However, the recent discussion about the potential effects of the GSP has been rather sceptical. [19; 20; 10] [12] argue that LDCs, which have been granted a complete DFQF market access via the GSP of Switzerland in 2007 and the EU in 2008, would not be able to substantially increase their agricultural exports to the EU

[7] At first the non-reciprocal preferential treatment of the DCs/LDCs contradicts the most-favored nation clause of the GATT of the World Trade Organization (WTO). This preferential treatment was given a legal effect within the GATT by means of a 1971 waiver from the most-favoured-nation obligation in Article I of the GATT. The system of tariff preferences was made permanent by the 1979 'Enabling Clause'. The Enabling Clause also contains a waiver to grant additional preferences exclusively to LDCs. [6]

[8] Following Art. 6 (2) Tariff Preference Regulation, those countries equated to the LDCs, are the ones that benefit from the debt-relief initiative and which are not cleared of debt yet.

with the exception of sugar exports, also due to non-tariff barriers. Nevertheless, we argue that Switzerland's highly protected agricultural and food market has become more accessible through the GSP.

The main focus of this paper is to investigate whether the GSP has increased the integration of the DCs and the LDCs into the Swiss market. To address this issue adequately, the GSP has to be compared to the most important trading schemes/regimes (membership in the WTO and bilateral FTAs). In this context the determinants of Swiss agro-food imports are identified using a gravity model.

MATERIALS AND METHODS

Data

For the descriptive analysis the customs statistics from the Swiss Customs Administration (SCA) for the years 2002 to 2011 was used. The dataset covers annual import values in CHF from around 190 countries at the product level (HS 8 digits level) from Chapters 01–24 of the international classification of the Harmonised System (HS). HS 01–24 include all agricultural and food products. For the descriptive analysis, data at the product level were aggregated to the product-group level (HS 4 digits level) and the market level (HS 2 digits level).

For the econometric estimations data of the Swiss agro-food imports from around 190 trading partners were aggregated to the product-group level by individual country, year, product and tariff (e.g. tariff codes 230 and 330 'developing countries' or tariff code 305 'duty-free under tariff'). The aggregated dataset at the HS 4 digits level contains about 80% zero values.

The dummy variables 'DCs' and 'LDCs' indicate whether a given DC or LDC benefits from the GSP. We are mainly interested in the sign and size of the coefficients of these variables. The information concerning the individual status of a GSP-benefiting DC or LDC was derived from 'Tariff Preference Regulations' for the years 2002 and 2011. The dummy variable 'Free Trade Agreement' ('FTA') was taken from a dataset of the World Trade Organization (WTO). [34] The dummy variable 'WTO member' is based on information from the website of the WTO. [35] The 'preference margin' was calculated based on the dataset of the SCA. Because of the different tariffs, which exist for different usages of a product (e.g. human consumption or technical usage), the highest tariffs were chosen in all cases. This assumption can lead to biases when calculating the 'preference margin' because the tariff for human consumption is always higher than any other tariff. The original dataset contains MFN and GSP tariffs at the product level.

Further control variables 'Gross Domestic Product' ('GDP'), 'Agricultural GDP', 'Population' and 'Economic Remoteness' developed by [4] come from a dataset of [27]. The control variables 'Distance', 'Border', 'Landlocked', 'Island' and 'Common Official Language' are from a dataset of the French Centre d'Etudes Prospectives et d'Informations Internationales (CEPII). [18] The Worldwide Governance Indicators (WGIs) were obtained from [26]. The scale of the WGI goes from 0 (weak) to +100 (strong). The WGI covers on average 215 countries.

The remaining sample covers 85.0% of the total agricultural and food imports in HS 01−24 from all trading partners between 2002 and 2011.

Stylised Facts

The following section provides a brief descriptive analysis of the agro-food imports of Switzerland during the observation period. Switzerland's trading partners are grouped in 'Rest of the World' (ROW), and DCs and LDCs benefiting from the GSP, respectively.

The agricultural and food imports from DCs and LDCs increased constantly during the period between 2002 and 2011, with those from DCs increasing by nearly 20% and those from LDCs increasing by more than 120%. DCs reached their highest import volume in the year 2007, when the global food crisis occurred. LDCs reached their highest import volume in our last observation year 2011.

In HS Chapters 01–24, the ROW had an average market share of 84% between 2002 and 2011. In the same period, DCs had an

average market share of 15% whereas LDCs had an average market share of only 1%, even though more than half of Switzerland's trading partners were underdeveloped countries.

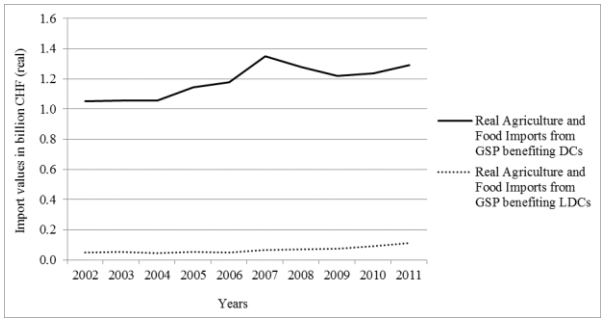

Fig. 1. Real agricultural and food imports in Switzerland from GSP-benefiting DCs and LDCs between 2002 and 2011 (values in billion CHF)

Between 2002 and 2011 a bulk of the agro-food imports from GSP benefiting DCs and LDCs entered Switzerland under a reduced tariff schedule or tariff schedule equal to zero. Figure 2 shows MFN=0[9], GSP and other reduced tariffs as a percentage of DCs' total exports to Switzerland between 2002 and 2011.

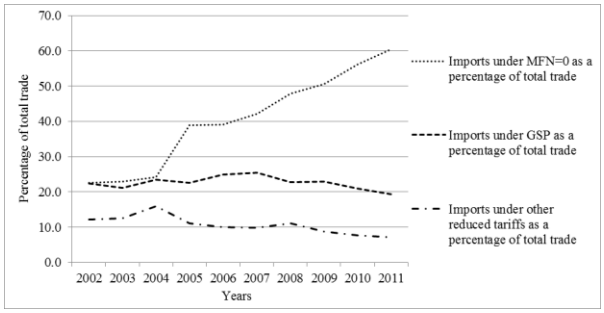

Fig. 2. Imports under MFN=0, GSP and other reduced tariffs as a percentage of DCs' total trade

From 2002 to 2004 about 50% of DCs' argro-food exports entered under reduced or zero tariffs. Therefore the remaining 50% of imports entered mostly under tariff schedule 'under tariff' (tariff code 110) which is granted to all WTO members. During 2002 and 2011, 23% of agro-food products from DCs were imported under the GSP, 41% were imported under the MFN=0 scheme and 10% were imported under other reduced tariff schedules[10]. Between 2002 and 2011, the coverage rate[11] for HS groups 01 to 24 averaged 34% according to the WTO Integrated Database. [32] From 2002 to 2011, the utilisation rate[12] of the DCs was about 46%. In total, 74% of the agricultural and food products from DCs were imported under a tariff lower than the 'under tariff' (tariff code 110) or equal to zero.

Figure 3 presents MFN=0, GSP and other reduced tariffs as a percentage of LDCs' total exports to Switzerland between 2002 and 2011.

In 2002, nearly 50% of LDCs' agro-food exports entered under the GSP, 40% under MFN=0 and 10% under other reduced tariffs. Between 2002 and 2005, imports under GSP decreased strongly. In 2005 only 16% of imports from LDCs entered under the GSP while 78% entered under MFN=0. Since 2006 and especially since the DFQF market access in 2007 imports under the GSP recovered and increased constantly.

However, on average 40% of imports entered under the GSP and about 60% under MFN=0. In contrast to GSP benefiting DCs, the coverage rate of the GSP benefiting LDCs was nearly 100% between 2002 and 2011. [33]

[9] The most-favoured-nation (MFN) principle is one of the principles of the World Trade Organization (WTO) trading system. 'A country should not discriminate between its trading partners (giving them equally most-favoured-nation or MFN-status); and it should not discriminate between its own and foreign products, services or nationals'. [32] Therefore, MFN=0 is a tariff which is equal to zero and which is granted to all WTO members.

[10] Other reduced tariffs are: tariff code 140 'customs relief', which is smaller than the tariff that is granted to WTO members (tariff code 110 'under tariff'); tariff code 355 'customs relief', which is equal to zero; tariff code 375 'commercial processing traffic', which is equal to zero; and tariff code 380 'returned goods', which is equal to zero.

[11] The 'coverage rate' is the percentage of products eligible for preferential treatment out of the total number of dutiable products. [29]

[12] The utilisation rate is calculated based on the following formula:

$$UR_{ijt} = Actual\ GSP_{ijt} / Eligible\ GSP_{ijt}$$

where UR_{ijt} denotes the utilisation rate of country *i* of product *j* at time *t*. $Actual\ GSP_{ijt}$ represents the actual trade flows imported under GSP conditions, and $Eligible\ GSP_{ijt}$ the GSP-eligible trade flows of country *i* and product *j* at time *t*. The 'utilisation rate' varies between 0 and 1. [29]

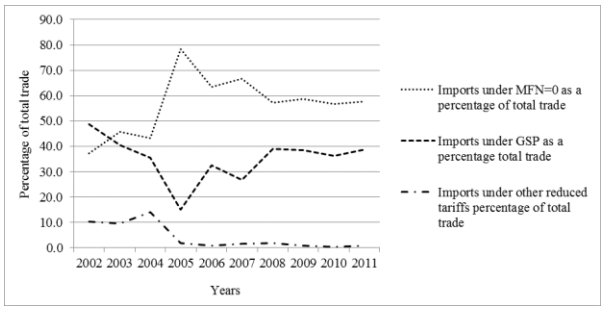

Fig. 3. Imports under MFN=0, GSP and other reduced tariffs as a percentage of LDCs' total trade

Therefore the utilisation rate of LDCs is equal to the percentage of imports from LDCs under the GSP (36%). In total 93% of agricultural and food imports from LDCs entered under an MFN or GSP tariff which was equal to zero or a GSP tariff which was smaller than the tariff that is granted to WTO members.

Method

[28] adopted the Newtonian theory of gravitation, which states that the gravitational force is proportional to the product of the masses of the two planets and inversely proportional to their squared distance, to the economic theory of international trade. Just as planets are mutually attracted in proportion to their sizes and proximity, countries trade in proportion to their relevant economic sizes (e.g. GDP or gross national income [GNI]) and their distance. [30] The gravity model performs very well statistically. Gravity models can also be used to explain and measure the effect of a policy ex post (e.g. granting trade preferences to DCs and LDCs) on trade flows. [21]

Our expanded gravity model follows [24]. Besides the integration of the classical gravity variables (GDP, Population, Distance and/or GDP per Capita), our expanded gravity equation contains a composite term measuring barriers and incentives for trade between two countries and a term measuring barriers to trade between each of them and the rest of the world. For the latter aspect, we use a simple approximation for an MRT according to [4][13].

In this study only unidirectional trade flows from ROW, GSP benefiting DCs and LDCs, respectively, to Switzerland were used. Therefore, factors which are specific for Switzerland (e.g. GDP, population or market information concerning the GSP) are captured by the constant term β_0. The basic form of the gravity model shown above can be written in the following form [equation (1)]:

$$lnIM_{ijt} = \beta_{0+} \beta_1 lnY_{it} + \beta_2 lnD_i + \beta_3 lnR_{it} + \varepsilon_{ijt}$$

In equation 1, i denotes the individual trading partner, j denotes the product group at the HS 4 digits level and t denotes the time. IM_{ijt} are the import values of a given product group and year (measured in CHF and aggregated on HS 4 digits level) from a given trading partner. Y_{it} is the GDP of a trading partner, D_i represents the distance between the capital city of a trading partner to Switzerland`s capital city Bern and R_{it} approximates the MRT term which measures trade barriers that each country faces with respect to all its trading partners.

The expanded gravity model is supplemented by two additional control variables. To control for the supply capacity of a trading partner within the agricultural sector, we include the GDP of the agricultural sector of a trading partner of Switzerland.

GDP, respectively GDP in the agricultural sector together with population size of a trading partner enables us to control for the productivity (efficiency) within the entire economy's production and service sector, and in particular for the productivity within the agricultural sector.

[21] suggested that the institutional quality in the exporting country is an important determinant of the utilisation of the GSP system. Thus, we include the Worldwide Governance Index (WGI) in our gravity

[13] [4] suggest estimating a linear approximation (by means of a first-order Taylor series expansion) of the multilateral resistance terms (MRTs), thus avoiding the non-linear procedure used in [3]. The MRT of [4] can be formalised by the following equation:

$$\sum_c \theta_c \, lnDistance_c - \tfrac{1}{2} \sum_k \sum_c \theta_k \, \theta_c \, lnDistance_{ck}$$

Where θ_c represents the share of importer c in the worldwide gross national income or gross domestic product. The first term is a weighted average of the trade costs towards all potential trade partners which importer c is facing. The second term is the worldwide resistance towards trade flows. This term is identical for all of the trade partners; therefore, it is captured in the constant.

model as a proxy for the institutional quality of a nation. We assume that the higher the institutional quality of a nation (the higher the value of the WGI), the better exporters are able to overcome trade barriers, and the higher the trade volumes are for a given product group.

The gravity approach can be supplemented by various binary control variables which depict exporter specific factors affecting trade. [24] τ_{it} denotes a vector of binary control variables like "common border", "island", "landlocked", "common official language". [25]

A_t are time fixed effects (FE) and A_j are product FE. Time FE control for time-related variations, which affect all countries the same, for example a global crop failure due to extreme weather events. Product FE allow controlling for product group-related effects/characteristics which are constant over time, for example 'perishable products vs. long-lasting products' or 'animal vs. vegetable products'.

Beside a provision of the Swiss agro-food import determinants, the main focus of this paper is to evaluate whether the GSP is suitable to integrate the DCs and the LDCs into the Swiss market for agro-food products. Therefore we include an additional vector of binary variables which indicate the status of a trading partner within the most important tariff schedules of Switzerland. [16; 1; 11] By including a vector of binary tariff schedule variables, equation (2) is the following:

$$lnIM_{ijt} = \beta_{0+} \beta_1 lnY_{it} + \beta_2 lnAY_{it} + \beta_3 lnP_{jt} + \beta_4 lnD_i + \beta_5 lnR_{it} + \beta_6 IQ_{it} + \delta\tau_{it} + \xi\gamma_{it} + A_t + A_j + \varepsilon_{ijt}$$

AY_{it} represents the GDP within the agricultural sector, P_{it} the population size of a trading partner and IQ_{it} the institutional quality of a trading partner measured by the WGI. γ_{it} denotes the vector of binary tariff schedule variables. It includes dummy variables that takes the value 1 if a trading partner has signed a Free Trade Agreement (FTA) with Switzerland, is a member of the GSP for DCs and LDCs, respectively, and is a member of the WTO, and zero otherwise.

In addition we have constructed three multiplicative interaction terms involving dummy variables which indicate the different memberships. Integrating multiplicative interaction terms, equation (3) becomes:

$$lnIM_{ijt} = \beta_{0+} \beta_1 lnY_{it} + \beta_2 lnAY_{it} + \beta_3 lnP_{jt} + \beta_4 lnD_i + \beta_5 lnR_{it} + \beta_6 IQ_{it} + \delta\tau_{it} + \xi\gamma_{it} + \varphi(X_{WTO} * X_c) + A_t + A_j + \varepsilon_{ijt}$$

where X identifies in general the above mentioned tariff schedule dummy variables. The subscript *WTO* depicts the dummy variable for the WTO membership and the subscript c depicts the tariff schedules GSP for DCs, GSP for LDCs or FTA whereby the first multiplicative interaction term identifies the additional effect of being simultaneously a member of the WTO and the GSP for DCs, while the second one identifies the additional effect of being simultaneously a member of the WTO and the GSP for LDCs. The third multiplicative interaction term refers to the additional effect of being simultaneously a member of the WTO and having a FTA with Switzerland. This approach captures the opportunity for an exporter to choose between different tariff schedules, when a given product can be exported under more than one tariff schedule. For example a given product can be exported under GSP and MFN. If the costs of compliance of the GSP are not compensated by the PM, it could be expected, that the exporter would choose the MFN tariff schedule. To include a multiplicative interaction term that captures the additional effect of being a member of the GSP and FTA doesn't make sense because DCs and LDCs who have signed a FTA with Switzerland are excluded from the GSP. We expect a positive sign for all of the three multiplicative interaction terms and therefore a positive effect on the size of an import flow.

[2] Alternatively, we include the preference margin (PM) of the DCs and LDCs as a more refined measure of GSP access in the gravity equation. The preference margin is calculated according to the following formula based on Cirera (2014). [8]

$$PM = (1 + MFN\text{-}tariff) / (1 + GSP\text{-}tariff)$$

The calculation of the values for the PM is based on 'ad valorem equivalents' (AVEs)[14]. Since trade data at HS 4 digits level (product group level) is used for this study we need to aggregate tariffs from HS 8 digits level (product level) to the HS 4 digits level. This issue is addressed by constructing a uniform tariff aggregated at HS 4 digits level by means of an 'Overall Trade Restrictiveness Index' (OTRI)[15]. Since elasticities of the import demand are not available for agro-food imports of Switzerland and an econometric estimation is beyond the scope of this article, the calculation of the aggregated uniform tariff at HS 4 digits level is based on [17].
By substituting the correspondent PM for the dummy variables GSP for DCs and GSP for LDCs we get the following equation (4):

$$lnIM_{ijt} = \beta_{0} + \beta_1 lnY_{it} + \beta_2 lnAY_{it} + \beta_3 lnP_{jt} + \beta_4 lnD_i + \beta_5 lnR_{it} + \beta_6 IQ_{it} + \delta\tau_{it} + \xi\gamma_{it} + \theta lnPM_{it} + A_t + A_j + \varepsilon_{ijt}$$

In this equation, the vector of dummy variables γ_{it} merely contains the dummy variables FTA and WTO member.
In a next step the dummy variable WTO member is interacted with the PM. The multiplicative interaction term captures the additional effect of being simultaneously a member of the WTO and a member a FTA. Thus, we estimate the following equation (5):

$$lnIM_{ijt} = \beta_{0} + \beta_1 lnY_{it} + \beta_2 lnAY_{it} + \beta_3 lnP_{jt} + \beta_4 lnD_i + \beta_5 lnR_{it} + \beta_6 IQ_{it} + \delta\tau_{it} + \xi\gamma_{it} + \theta_1 lnPM_{it} + \theta_2(X_{WTO} * lnPM_{it}) + \varphi(X_{WTO} * X_{FTA}) + A_t + A_j + \varepsilon_{ijt}$$

Where X_{FTA} is the in equation (2) introduced binary dummy variable that indicates if a trading partner has signed a FTA with Switzerland. The multiplicative interaction terms which combine the PM and the WTO membership capture the above mentioned aspect of the opportunity for an exporter to choose between different tariff schedules, when a given product can be exported under more than one tariff schedule.
We estimate the expanded gravity models using Poisson Pseudo Maximum Likelihood (PPML). In contrast to OLS, PPML is able to include zero values and account for heteroscedasticity, which are both common in trade data. [22] The PPML is the one of the most reliable estimators which are currently available to estimate gravity models in the presence of excessive zero values. [4] Thus, we only present estimation results for PPML. Results from OLS regression are available upon request.

RESULTS AND DISCUSSIONS

Table 1 presents the regression results for PPML for the dummy setup and the model with the PM based on ad valorem uniform tariffs. If possible, we compare our regression results with regression results from the literature that deals with preferential trade agreements like the GSP. Column 2 contains estimations for equation (2) and column 3 the estimations for equation (3). Column 4 contains regression estimations for equation (4) and column 5 regression estimations for equation (5).
The emphasis of the following interpretation is dedicated to the main research question of this paper: Does the GSP foster agricultural and food imports to Switzerland from GSP benefiting DCs and LDCs?
The variables that are estimated in logs can be interpreted as elasticities. The marginal effects are presented for the model variations where the multiplicative interaction terms are

[14] Switzerland applies specific tariffs instead of ad valorem tariffs. For this purpose we calculated AVEs which are based on the following formula:

$$AVE\ (\%) = (specific\ tariff\ per\ kg\ /\ unit\ value)^{x}\ 100$$

AVEs express specific taxes in percentages. The level of the AVE depends on the unit value (e.g. 1 kg), which is a proxy for the import price. [13]

[15] The formula for an OTRI is as follows:

$$OTRI_c = \sum_n m_{n,c}\varepsilon_{n,c}T_{n,c} / \sum_n m_{n,c}\varepsilon_{n,c}$$

Where the OTRI is the weighted sum of protection levels ($T_{n,c}$). The weights are the elasticity of import demand ($\varepsilon_{n,c}$) and the import volumes ($m_{n,c}$). [14] The formula implies a (negative or positive) correlation between the tariff rates (protection levels) and the elasticity of imports. Therefore, the main challenge is to determine an aggregated uniform tariff, which leads the national welfare unaffected. A detailed discussion on the issue of the unaffected welfare in the context of tariff aggregation can be found in [9].

included (columns 3 and 5).

Table 1. PPML regression results with the dependent variable IMP_{ijt} and PM based on AVEs (robust standard errors in parentheses); *** denotes significance on the 1% level, ** on the 5% level and * on the 10% level

Independent Variable	PPML Dummy 1	PPML Dummy 2 Interaction	PPML PM	PPML PM Interaction
GSP DCs	1.074*** (0.094)	-0.095 (0.211)		
GSP LDCs	1.055*** (0.163)	1.917*** (0.404)		
FTA	0.274*** (0.065)	0.247 (0.276)	0.038 (0.056)	0.310 (0.240)
WTO Member	1.290*** (0.168)	0.945*** (0.196)	1.369*** (0.167)	1.441*** (0.144)
(WTO * DCs)		1.096*** (0.096)		
(WTO * LDCs)		0.887*** (0.159)		
(WTO * FTA)		0.270*** (0.066)		0.038 (0.056)
lnPM DCs			0.275*** (0.052)	0.491*** (0.108)
lnPM LDCs			0.095** (0.030)	0.062 (0.071)
(WTO * lnPM DCs)				0.269*** (0.053)
(WTO * lnPM LDCs)				0.096** (0.031)
lnGDP	0.363*** (0.048)	0.369*** (0.047)	0.252*** (0.047)	0.251*** (0.048)
lnAgriculture GDP	0.712*** (0.052)	0.710*** (0.051)	0.656*** (0.050)	0.656*** (0.050)
lnPopulation	−0.476*** (0.044)	−0.480*** (0.044)	−0.315*** (0.042)	−0.314*** (0.042)
lnDistance	−0.807*** (0.066)	−0.815*** (0.066)	−0.843*** (0.065)	−0.843*** (0.066)
Border	0.739*** (0.127)	0.673*** (0.130)	0.836*** (0.130)	0.839*** (0.131)
Landlocked	−0.546*** (0.063)	−0.543*** (0.063)	−0.568*** (0.063)	−0.568*** (0.063)
Island	−0.354*** (0.079)	−0.359*** (0.079)	−0.364*** (0.078)	−0.364*** (0.078)
lnRemoteness	10.152*** (1.559)	10.201*** (1.558)	11.793*** (1.548)	11.797*** (1.548)
Common Language	−0.272** (0.108)	−0.213** (0.107)	−0.352*** (0.105)	−0.355*** (0.106)
lnWGI	1.112*** (0.123)	1.103*** (0.120)	0.999*** (0.120)	0.999*** (0.120)
Product FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
No. of observations	338,796	338,796	338,796	338,796
Pseudo R^2	0.520	0.521	0.518	0.518

Most of the classical gravity variables show their expected signs with the exception of the variable "common language". This variable shows an unexpected negative sign. Since the literature has already pointed out that common boarder, geographic distance, and other covariates do affect trade flows we omit this discussion and put more focus on the discussion about the effectiveness of the different trading schemes.

Initially, the 'Dummy 1' model shows an unambiguous picture: All of the tariff schedules show an expected positive sign and are highly significant. The strongest effect on the size of an import flow is constituted by the WTO membership. The effect of being a member of the GSP for DCs is stronger than the effect of being a member of the GSP for LDCs. The weakest effect on the size of an import flow is given by the variable 'FTA'.

For the model 'Dummy 2' where the multiplicative interaction terms are introduced, the picture changes: The positive effect on the size of an import flow of the WTO membership is still given. Though, the effect of being a member of the GSP for DCs is negative but statistically not significant, while the effect of being a member of the GSP for LDCs is positive and highly significant. The additional effect of being simultaneously a member of the WTO and the GSP, which captures the opportunity for an exporter to choose between different tariff schedules is for DCs and LDCs positive and statistically significant. However, the additional effect for DCs is stronger than the additional effect for LDCs. The effect of signing a FTA with Switzerland is positive but statistically not significant. Only the combination of being simultaneously a member of the WTO and signing a FTA causes a positive and statistically significant effect.

The positive and significant effect of the GSP for DCs and LDCs remains when introducing the PM instead of binary tariffs schedule dummies. Being a member of the WTO and signing a FTA has likewise a positive effect on the size of an import flow, while only the effect of being a member of the WTO is statistically significant.

Adding multiplicative interaction terms to the gravity model where the PM is included, the PM has a positive and statistically significant effect for the DCs, whereas the effect of the PM for the LDCs is positive but statistically not significant. The combination of being simultaneously a member of the WTO and the GSP merely triggers an additional positive and statistically significant effect for the LDCs.

In this context, [20] argue that DCs which are excluded from the GSP adopt more liberal trade policies than those remaining in the GSP. Furthermore they suggest that especially DCs may be best served by a full integration into the WTO trade regime rather than granting unilateral trade preferences via the GSP.

In accordance to the findings of our descriptive analysis, the regression estimates clearly indicate that the combination of being a member of the WTO and the GSP fosters agriculture and food imports from DCs and LDCs. Assuming that the DCs and LDCs with a higher state of economic development have comparative advantages which emerge from a high productivity within the agricultural sector, the additional cutback of protectionism through lower tariffs or a complete duty free market access via the GSP leads to an improved market access for agricultural and food products.

Most model variations of this article show a predominantly modest or negative effect of the GSP for DCs and especially for LDCs. With regard to the performance of the Swiss GSP the relatively low utilisation might be mainly due to compliance costs associated with the GSP. The findings of this article agree with [2], who evaluated the impact of non-reciprocal trade preferences at the HS 2 digits level using a gravity model with a similar dummy set-up compared with our expanded gravity model. Their results indicate that the effects of 'GSP DCs', 'GSP LDCs', 'other preferences' and 'FTA' are not always positive and statistically significant.

The GATT/WTO negotiations since 1947 have led to a gradual reduction of the average applied tariffs. A large share of the applied MFN-tariffs are nowadays near or equal to zero. [16] In accordance to [12] non-tariff barriers (NTBs) are especially for LDCs more relevant than tariffs. While the latter are mostly near or equal to zero, NTBs of the GSP in form of the restrictive rules of origin and the certificate of the direct shipment are besides sanitary and phytosanitary requirements, private product standards and environmental standards additional obstacles to benefit from a complete DFQF market access. To overcome NTBs the institutional quality of a nation is of decisive importance. Accordingly, the variable 'WGI', which measures the institutional quality of a nation, shows the expected positive sign and is highly significant for all model variations.

DCs and LDCs which are excluded from the Swiss GSP have signed a FTA with Switzerland. The results indicate for nearly all of the model variations a statistically positive effect of signing a FTA. [15] investigates the determinants of the Swiss agricultural exports by means of a gravity model. The findings indicate a weak positive effect of a FTA and therefore disagree with the results of this article for imports.

CONCLUSIONS

Although the Swiss GSP shows at first glance a modest performance, it has to be emphasised that the GSP works within the framework of the WTO.

While the multilateral openness of the WTO has grown over the past 70 years, the scepticism concerning the effectiveness of preferential trading schemes has also grown. Granting preferential market access is linked to restrictive, legal requirements (bureaucratic obstacles: certificates of origin and direct shipping).

Compliance with these bureaucratic obstacles is associated with transaction costs (costs of compliance).

These issues can be considered as the main reasons for the relatively meek performance of the Swiss GSP.

Whereas, virtually no costs of compliance occur to use the WTO tariff schedule. However, the empirical evidence of this article clearly indicates that both, being simultaneously a member of the WTO and the GSP, fosters agro-food imports from DCs and LDCs.

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