# Good governance and preferential trade: evidence from the Swiss generalized system of preferences

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# Good governance and preferential trade: evidence from the Swiss generalized system of preferences

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## Abstract

**Purpose** – The purpose of this paper is to determine if the institutional quality of developing countries (DCs) and least-developed countries (LDCs) contributes to a significant increase in the utilization rate of the Swiss generalized system of preferences in the agro-food sector.
**Design/methodology/approach** – The authors use state of the art regression techniques accounting for zero values to identify if the institutional quality – separately depicted by the Worldwide Governance Indicators, the Index of Economic Freedom and the Human Development Index – can contribute in overcoming non-tariff barriers (NTBs) to trade.
**Findings** – The institutional quality exerts a consistent positive effect on the level of utilization of trade preferences.
**Research limitations/implications** – Swiss food trade represents, of course, only a very small share of world trade, therefore it would be worthwhile to extend the analysis to other countries and sectors.
**Practical implications** – Industrialized countries' development policies should more strongly focus on capacity building in DCs and LDCs to strengthen trade-related institutions.
**Originality/value** – The study focuses on an often underemphasized element in international trade relations – the role of the institutional quality in overcoming NTBs to trade.

**Keywords** Good governance, Agro-food trade, Generalized system of preferences,
Utilizing trade preferences

**Paper type** Research paper

## 1. Introduction

Since 1 March 1972, Switzerland, along with the major trading powers USA, Australia, Canada, Japan and EU, has granted developing countries (DCs) and least-developed countries (LDCs) preferential tariff terms for industrial and agricultural products as part of the generalized system of preferences (GSP), on a voluntary and non-reciprocal basis. The unilateral preferential treatment of DCs and LDCs initially contradicted the "most-favored-nation (MFN)" principle of the World Trade Organization (WTO). In 1971, a waiver of the MFN principle was established in Article I of the General Agreement on Tariffs and Trade in order to provide a legal framework for the unilateral granting of tariff preferences to DCs and LDCs (Bartels and Häberli, 2010). In this context, the present article concentrates exclusively on the agricultural and food products of the Harmonized System (HS), chapters 1-24.

Unlike the EU, Switzerland offers preferential market access for DCs and LDCs[1] exclusively via the GSP. Moreover, unlike the EU, Switzerland has no GSP+, and no "everything but arms" initiative. The tariff lines entitled to preferential treatment also differ in contents and scope. Consequently, Switzerland's GSP can essentially be classified into two schemes.

The first scheme applies to the DCs, with preferential tariff rates being granted depending on the product concerned. Between 2002 and 2011, the coverage rate[2] for HS chapters 01 to 24 averaged 34 percent according to the WTO Integrated Database (WTO, 2014). Of all tariff lines eligible for preferential treatment, an average of around 50 percent were exempt from duty. The second scheme is geared to the LDCs and can be

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compared with the EU's "everything but arms" initiative. Since 1 April 2007, the LDCs have been granted duty-free and quota-free market access as part of the second GSP scheme for all tariff lines with the exception of weapons. Moreover, the LDCs are not bound by seasonal restrictions (Häberli, 2008). Between 2002 and 2007, the product coverage rate for HS chapters 01 to 24 was 84 percent on average (WTO, 2014), with an average of around 40 percent of the tariff lines being duty-free.

Because Switzerland's utilization of GSP preferences entails the overcoming of bureaucratic hurdles, the main focus of this article is to determine whether the quality of a favored nation's institutions contributes to a significant increase in the utilization rate of the Swiss GSP. To investigate this, we use basic variables of the economic gravity equation as done in most studies involving an empirical evaluation of the utilization of preferential trade arrangements (PTAs) such as the GSP (e.g. Gasiorek *et al.*, 2010; Manchin, 2006). A detailed description of literature including determinants potentially influencing the utilization rate can be found in the Appendix. Furthermore, the indicator "utilization rate" is calculated as the ratio between imports which *de facto* entered under GSP and GSP-eligible imports. We therefore consider it appropriate to adapt basic variables of the economic gravity model for the current issue.

To our knowledge, Manchin (2006) is the only publication which, in passing, takes up the subject of "institutional quality" as part of an analysis of EU trade preferences (GSP and Lomé Convention) *vis-à-vis* the African, Caribbean and Pacific Group of States (ACP countries) over the period 1992 to 2001 beyond the variables "GDP" and "GDP per capita." The institutional quality of a state in terms of overcoming bureaucratic hurdles can have a positive effect on the utilization rate of PTAs. The results obtained by Manchin (2006), however, which cite the Economic Freedom Index (EFI) provided by the Fraser Institute, show that institutional quality has an equivocal effect on the utilization rate of the EU's preferential trade systems.

The remainder of this article is organized as follows. First, Section 2 describes the underlying data used. Section 3 presents stylized facts on the evolution of DCs' and LDCs' utilization rates during 2002-2011 (Subsection 3.1) and on the correlation of Good Governance indicators (Subsection 3.2). In a following step, the concept of "Good Governance" is elucidated and related to the present issue (Section 4). Section 5 presents the empirical strategy with a focus on dealing with zero values. Here, we provide information on the Poisson Pseudo Maximum Likelihood (PPML) estimator (Subsection 5.1) and on the Heckman selection model (Subsection 5.2). In the following Section 6, the regression results for the PPML estimator (Subsection 6.1) and the Heckman selection model (Subsection 6.2) are presented and discussed. To conclude, the essential findings are summarized in brief and policy recommendations are given based on the findings of the study (Section 7).

## 2. Data

The "utilization rate" at the product level is chosen as the dependent variable. GSP imports and GSP-eligible imports are the basis for calculating the "utilization rate" and are obtained from the Swiss-Impex database (SCA, 2015). The data set contains annual observations. Switzerland's foreign trade statistics were methodically converted from producing country to country of origin in 2012. This methodological change in the foreign trade statistics has some strong effects on the export values of the DCs and LDCs. To ensure comparability of the results, the year 2012 is excluded from this analysis. The utilization rate is calculated based on the following formula:

$$UR_{ijt} = \left( \frac{Preferential\ \ GSP_{ijt}}{Eligible\ \ GSP_{ijt}} \right) \times 100 \tag{1}$$

where $UR_{ijt}$ denotes the utilization rate of country $i$ of product $j$ at time $t$. $Preferential\ GSP_{ijt}$ represents the actual trade flows introduced under GSP conditions, and $Eligible\ GSP_{ijt}$ the

GSP-eligible trade flows of country $i$ and product $j$ at time $t$. The value "utilization rate" varies between 0 and 100 percent (UNCTAD, 1999).

The "preference margin" is calculated based on the data set of the SCA. This data set was specially prepared for this paper. Because of the different tariffs which exist for the different usages of a product (e.g. human consumption or technical usage), the highest tariffs are chosen in all cases. This assumption can lead to biases when calculating the "preference margin" because the tariff for human consumption is in all cases higher than any other tariff. The preference margin is calculated based on the following formula:

$$Preference\ \ Margin = 1 + (Tariff_{MFN} - Tariff_{GSP}) \tag{2}$$

where the MFN tariff represents the tariff for all WTO members, whereas the GSP tariff is granted only to the DCs and LDCs included in the GSP. The GSP tariff is at least equal to the MFN rate. As a rule, however, it is lower than the MFN tariff where the latter is not equal to zero (Olarreaga and Özden, 2005). Because Switzerland applies specific tariffs, one would expect to compute "ad-valorem equivalents" (AVEs). 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 (International Trade Centre, 2010). As unit values vary, the preference margin calculated based on AVEs likewise varies, which, in consequence, causes an unnecessary variation of this independent variable. Consequently, we use specific tariffs and do not calculate AVEs.

The independent variables "GDP" and "population" are obtained from a data set of the World Bank (2014). "Distance" and "common official language" originated from a data set of the French Center d'Études Prospectives et d'Informations Internationales (Mayer and Zignago, 2011). The variable "economic remoteness" originates from a data set of the World Bank (2014). The economic remoteness according to Head of trade partner $c$ can be formalized by the following equation:

$$Remote_c = \sum k \frac{GDP_c}{GDP_w} Distance_{ck} \tag{3}$$

where $k$ is an index running above all trade partners (including $c$), $Distance_{ck}$ is the distance from trading partner $c$ to $k$, and $GDP_c$ / $GDP_w$ denotes trading partner $c$'s share of worldwide GDP.

The WGI is derived from The World Bank (2013). The scale of this index ranges from 0 (lowest rank) to 100 (highest rank). The arithmetic mean is calculated based on the values of the six dimensions of the WGI. The WGI covers on average 200 countries (World Bank, 2013).

The IEF is published by the *Wall Street Journal* and the Heritage Foundation. The scale of this index ranges from 0 (repressed) to 100 (free). The economic freedom is based on ten quantitative and qualitative factors which are categorized in four dimensions. The IEF covers 186 countries (Heritage Foundation, 2014).

The HDI is published by the UNDP (2014) and is based on the "capability approach" by Sen (1999). The scale ranges from 0 (low human development) to 1 (very high human development). The HDI is calculated as the geometric mean based on the following three indices: a health index, an education index and an index which is based on Gross National Income (GNI). The HDI covers 186 countries.

## 3. Stylized facts

### *3.1 The evolution of DCs' and LDCs' utilization rate during 2002-2011*

Based on the formula presented in Section 2, we calculate annual average utilization rates for DCs and LDCs for HS chapters 01 to 24 during 2002-2011. Figure 1 shows the corresponding evolution of the DCs' and LDCs' utilization rates during 2002-2011.

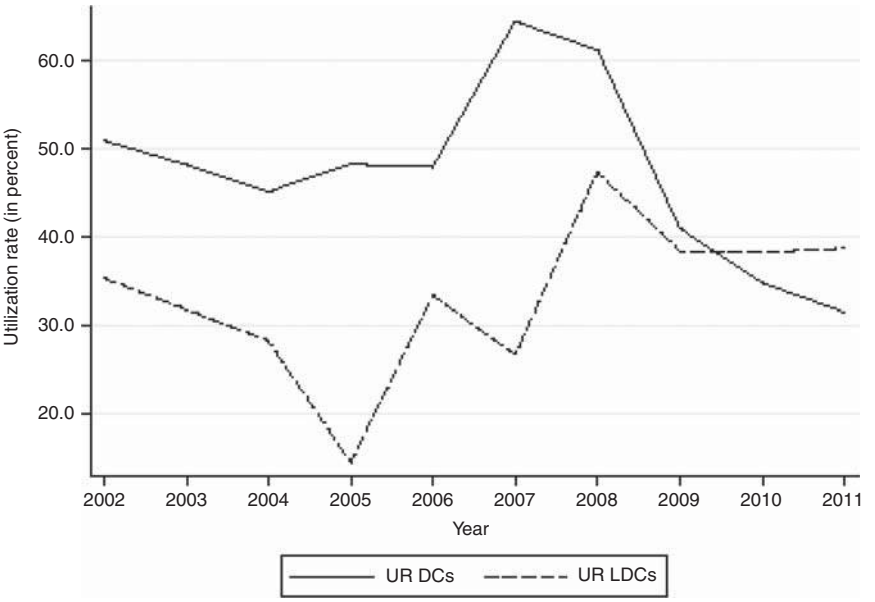


**Figure 1.**
The evolution of DCs' and LDCs' utilization rate during 2002-2011

First, it is clear that DCs' and LDCs' annual average utilization rates in the agro-food sector prove to be somewhat volatile during 2002-2011. Even though the average product coverage for DCs during 2002-2011 is lower than for LDCs (see Section 1), DCs capture higher annual average utilization rates during 2002 to 2009. A strong slump in LDCs' utilization rate can be observed between 2004 and 2005. The utilization rate drops from 28 percent in 2004 to 15 percent in 2005. Afterwards, LDCs' utilization rate rises continuously. The peak of LDCs' utilization rate is reached in 2005 with nearly 50 percent. In contrast, DCs reach their highest utilization rate of nearly 65 percent in 2007. Afterwards, DCs' utilization rate drops and, as from 2010, LDCs gain higher utilization rates than DCs. From 2002 to 2011, on average 46 percent of preferences under Switzerland's GSP in the agricultural and food sector are utilized for DCs whereas on average 36 percent are utilized for LDCs.

In general, DCs' utilization rates tend to be high in markets with medium processed products such as HS chapter 02 "Meat and edible meat offal" and in markets with highly processed products such as HS chapter 19 "Preparations of cereals, flour, starch or milk" or HS chapter 20 "Preparations of vegetables, fruits, nuts or other plants." In contrast, DCs' rates tend to be low or equal to zero in markets with low processed products such as HS chapter 10 "Cereals" or HS chapter 12 "Oil seeds and oleaginous fruits." The same holds true for LDCs' utilization rates. Corresponding utilization rates tend to be high in markets with highly processed products (e.g. HS chapters 19 "Preparations of cereals, flour, starch or milk," 20 "Preparations of vegetables, fruits, nuts or other plants" and 21 Miscellaneous edible preparations) and low in markets with low processed products (e.g. HS chapter 12 "Oil seeds and oleaginous fruits") (detailed calculations of the utilization rate by sector are available upon request).

### *3.2 The correlation of good governance indicators*

Because utilizing trade preferences is associated with bureaucratic obstacles in the form of proof of origin, proof of direct shipment and other non-tariff barriers (NTBs) to trade, we are mainly interested in the effect of a nation's institutional quality depicted by three

Good Governance indicators (WGI, IEF and HDI) on utilizing trade preferences. In this context, the question arises if these indicators are positively correlated with each other, and if these indicators measure (nearly) the same level of the institutional quality of a nation. Accordingly, Figure 2 presents the pairwise correlation of these three Good Governance indicators depicted by three scatter plots. For the pairwise correlation we use data sets which covered the time period from 2002 to 2011 and which include all countries (including industrialized countries).

It is evident that the three Good Governance indicators are correlated positively with each other. However, only the relationship between the WGI and IEF is more or less linear; the relationships between the HDI and WGI, and between the HDI and IEF, tend to be less linear. For instance, some countries show a relatively high HDI which ranges between 0.6 and 0.8, but the same countries end up with a low WGI which ranges between 10.0 and 20.0. This seems to be a contradiction because effective political institutions free from corruption represented by the WGI should lead to a high level of human development represented by the HDI.

To measure the strength of the linear relationship between the three Good Governance indicators, we use Pearson's product-moment coefficient $r$ which can range between +1 and −1 depending on whether the relationship is positive or negative, respectively. In contrast to Spearman's correlation coefficient, which determines the strength and direction of a monotonic relationship between two variables, Pearson's correlation coefficient measures the strength and direction of a linear relationship between two variables. A correlation coefficient between 0.1 and 0.3 indicates a low strength of a linear relationship, a correlation coefficient between 0.3 and 0.5 a medium strength of a linear relationship and a coefficient between 0.5 and 1.0 a high strength of a linear relationship (the same holds true for negative values of $r$) (Lund and Lund, 2013a, b). Table I shows the corresponding Pearson's pairwise product-moment correlation coefficients for the three Good Governance indicators used in this study.

As mentioned above, the positive correlation between the WGI and IEF visually observed by the scatter plots from Figure 1 is more or less linear. Accordingly, Pearson's

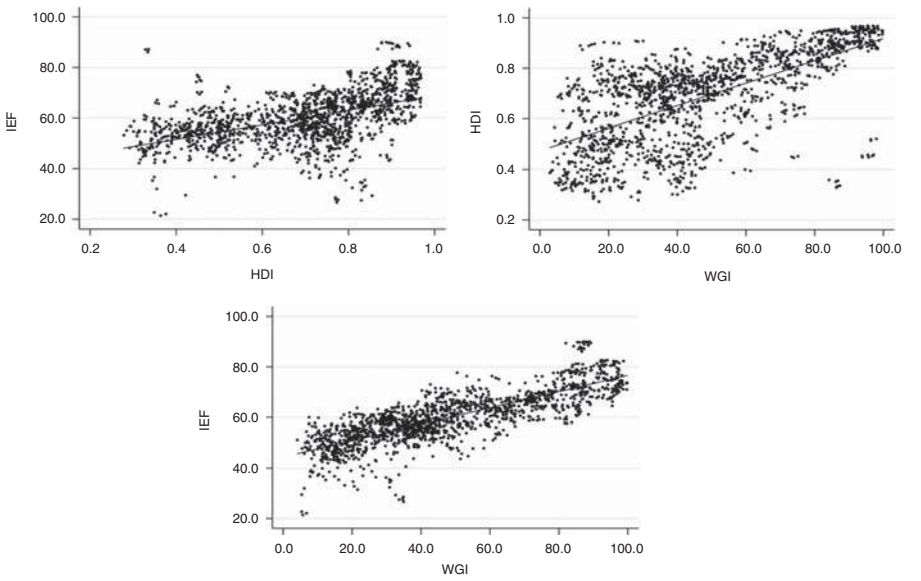


**Figure 2.**
Pairwise correlation of Good Governance indicators

correlation coefficient $r$ in the amount of 0.8 shows a significant and strong positive correlation between the WGI and IEF. The positive correlation between the WGI and HDI in the amount of 0.6 is likewise significant and strong. Only the positive correlation between the IEF and HDI is just below the threshold which indicates a strong correlation. However, the positive correlation between the IEF and HDI is statistically significant. To conclude, the pairwise correlation of the three Governance indicators tends to indicate a strong and significant positive correlation. Consequently, these three indicators measure (nearly) the same level of the institutional quality of a nation.

## 4. Good Governance, institutions and utilizing trade preferences

Grethe (2001) emphasizes the threat that the reduction of classical agricultural protection (tariffs) might enhance the possibility of NTBs being misused for protectionist purposes. The implementation and intensification of NTBs are bound by institutional and financial preconditions. Utilizing unilateral or bilateral trade preferences also generates costs (costs of compliance) for obtaining the certificate of origin (rules of origin) and the certificate of direct transport. These costs could be seen as NTBs. Exporters in DCs and LDCs in particular consider NTBs in the form of additional trade documents (e.g. certificates of origin and of direct shipment) as a major trade barrier (UNCTAD, 2013). The decision whether or not to utilize the GSP system is made by the exporter. Providing information on the current GSP system and on impending changes in the system is the responsibility of state institutions. The same holds true for the creation of framework conditions for overcoming other NTBs. Bureaucratic hurdles, particularly the restrictive rules of origin, are a significant obstacle to utilization of the GSP. According to Häberli (2008), the opportunities offered by the GSP are largely unknown in most of the responsible state institutions and among DC and LDC exporters. The same, however, applies to importers in the respective industrial nations. An exporter's decision whether or not to utilize trade preferences depends on the preference margin. A rationally behaved (i.e. profit-maximizing) exporter chooses to take advantage of trade preferences only if at the margin the tariff discount (preference margin) compensates for the costs of compliance associated with all preferential trade agreements (bilateral or unilateral). The main point of preferential trade systems granted exclusively to the DCs and LDCs is to overcome bureaucratic hurdles through suitable state institutions in order to achieve an economic advantage through reduced duty, or no duty whatsoever.

Because the creation of institutional framework conditions is a remit of the state and the quality of institutions is decisive for positive social and economic development, the Good Governance of the GSP-favored country is depicted in the regression equation. Here, the "Good Governance" concept of the World Bank's WGI is used. According to the WGI, Good Governance encompasses the following six dimensions: "voice and accountability," "political stability and absence of violence," "government effectiveness," "regulatory quality," "rule of law" and "control of corruption." In this context, Good Governance is the precondition for creating state institutions to achieve sustainable development in the DCs and LDCs. Acemoglu and Robinson (2012) distinguish between "inclusive" and "extractive" institutions, with only the former being a guarantor of sustainable development. The Good

**Table I.** Pearson's pairwise product-moment correlation coefficients

| | HDI | WGI | IEF |
|---|---|---|---|
| HDI | 1.000 (1,618) | | |
| WGI | 0.649*** (1,614) | 1.000 (1,679) | |
| IEF | 0.496*** (1,496) | 0.804*** (1,539) | 1.000 (1,540) |

**Notes:** Number of observations are given in parentheses. *$p < 10$ percent; **$p < 5$ percent; ***$p < 1$ percent

Governance concept thus encompasses the aspect of distributive justice in that the resulting inclusive state institutions ensure that each citizen has the same real opportunities to participate in economic and social processes. In the present paper, we assume that high "Good Governance indicator" values lead virtually automatically to better performance of a state in the area of trade policy. This is especially relevant in the context of development policy because political instability and lack of access to media information in most DCs and LDCs promote corruption and prevent the creation of suitable state institutions to counteract social and economic underdevelopment (Pellegrini and Gerlagh, 2007; Control Risks, 2014). According to Weller and Ulmer (2008), however, there may not always necessarily be a connection between "Good Governance" on the one hand and "trade creation" or "utilizing trade preferences" on the other. Indonesia, for example, experienced economic growth under a corrupt dictatorship, and China has been able to attract foreign investors despite persistent corruption. Thus, we can logically assume that nations with a low per capita GDP may still have a political system of high institutional quality, especially because the concept of "Good Governance" does not focus exclusively on positive influence on trade policy, such as posited in this paper (UNESCAP, 2014).

Whereas the WGI and IEF focus directly on the World Bank's definitions of "Good Governance," the HDI and the level of social and economic development of a state which it depicts are to be understood as the result of inclusive state institutions. In this context, Williams and Siddique (2008) highlights the strengths and limits of individual "Good Governance indicators," pointing out for example the strengths and weaknesses of the Fraser Institute's EFI, which is closest to the IEF from a methodological perspective[3]. The question of which Good Governance indicator is appropriate for which study in which context is not answered unequivocally. It is therefore up to the individual scientist in which context and for what question/issue to use such Good Governance indicators for the modeling of trade-related circumstances focusing on institutional quality. In this context, Ritzel *et al.* (2018) argue that estimating trade liberalization is usually plagued by selection bias. A cutback of tariff barriers on trade in the framework of bilateral Free Trade Agreements (FTAs) is not randomized, since countries select themselves into FTAs. In contrast to bilateral FTAs, GSP-benefiting DCs and LDCs do not select themselves into the status of an LDC or DC and the decision whether a country is included in the LDCs, or graduates from the Swiss GSP, is based on three threshold-based inclusion criteria (per capita income, economic vulnerability, and human development) that are defined by the UNDP. Using the HDI as a proxy for UN LDC status criteria solves the selection problem, so the authors are able to provide an unbiased estimate of reduced trade policy uncertainty on the level of Bangladesh's preferential textile exports. As the findings of Section 3.2 unequivocally indicate a positive pairwise correlation of the Good Governance indicators used in this study, the IEF and WGI likewise solve the selection problem.

## 5. Empirical strategy – dealing with zero values

Because the utilization rate can be equal to zero, it is inappropriate to use Ordinary Least-Squares (OLS) (the sample contains around 55 percent zero values). Consequently, we estimate our models using PPML with pooled panel data as baseline estimation (Section 5.1). As an additional robustness check, Shepherd suggests using the Heckman selection model (Section 5.2).

### *5.1 Poisson Pseudo maximum likelihood*

The PPML technique is able to control for zero values and heteroscedasticity which is common for trade data (Silva and Tenreyro, 2006). Therefore, the PPML estimator provides consistent estimates of nonlinear models such as gravity. Although the dependent variable for the PPML regression is specified as utilization rate levels rather than logarithms, the

coefficient of any independent variables entered in logarithms can still be interpreted as simple elasticities.

First, we estimate the following equation using a pooled sample by not considering the country group effect:

$$UR_{ijt} = \beta_0 + \gamma\ GoodGov_{it} + \delta\ Gravity_{it} + \theta\ GSP_{ijt} + \varepsilon_{ijt} \quad (4)$$

where $i$ denotes the trading partners from the GSP, $j$ denotes the product on HS 8 digit level and $t$ denotes the time. $UR_{ijt}$ is the utilization rate of a GSP-benefiting country calculated on HS 8 digit level. $GoodGov_{it}$ represents the institutional quality of a nation depicted separately by the WGI, IEF and HDI. All of these indicators are included separately in our model. We hypothesize that the higher the institutional quality of a GSP-benefiting country (the higher the value of the WGI, IEF or HDI), the better a GSP-benefiting country is able to overcome NTBs and so the higher is the utilization rate for a given product and year.

$Gravity_{it}$ is a vector of gravity controls, containing the economic size of a trading partner represented by the $GDP_{it}$, the population of a GSP-benefiting country ($Population_{it}$), the bilateral distance ($Distance_i$) between the capital city of a GSP-benefiting country to the Swiss capital Bern and the MTR term ($Remoteness_{it}$), which measures the trade barriers that each country faces with respect to all its trading partners. Furthermore, $Gravity_{it}$ contains $Official\ Language_{it}$ which is a dummy variable that indicates whether a GSP-benefiting country has the same official language as Switzerland. The dummy variable takes the value 1 if a GSP-benefiting country has the same official language and the value 0 otherwise (Tinbergen, 1962).

$GSP_{ijt}$ represents a vector of GSP-related controls, containing the level of GSP-eligible trade of a GSP-benefiting country measured in CHF ($GSPeligible_{ijt}$), the preference margin ($Preference\ margin_{ijt}$) and a binary dummy variable $Regional\ cumulation_{it}$, that takes the value of one for countries which are permitted regional cumulation within the Swiss GSP, and zero otherwise. Finally, $GSP_{ijt}$ contains three product-related dummy variables less, medium and highly processed ($primary_{jt}$, $medium\ processed_{jt}$ and $highly\ processed_{jt}$). We exclude the dummy variable which indicates whether or not a product is less processed ($primary_{jt}$) from the regression equation as the base category to estimate the effect of medium and highly processed products in relation to less processed products. $\varepsilon_{ijt}$ represents the residual term for unobserved characteristics of a country $i$, product $j$ at time $t$ (Note: Continuous variables are transformed into logs; product-related dummy variables are excluded from model variations where product fixed effects are added to the model).

Second, to identify the country group effect for DCs (and in turn for LDCs) for each independent variable, we use interaction terms. Including an interaction term reflects a theory that the impact of one $x$ (e.g. the preference margin) is conditional upon the specific value of the other $x$ (the country group status of the DCs) (McDaniel, 2016). The corresponding models take the following basic form represented by Equation (5):

$$UR_{ijt} = \beta_0 + \beta_1 X_{ijt} + \beta_2 DC_{it} + \beta_3 \left(X_{ijt} \times DC_{it}\right) + \varepsilon_{ijt} \quad (5)$$

where $X_{ijt}$ contains all binary and continuous variables used in Equation (4). As mentioned above, to identify the country group effect of DCs, we interact each $x$ with the binary variable $DC_{it}$. Here, we calculate the marginal effects for a nonlinear combination of estimators for each $x$ ($X_{ijt}$ + ($DC_{it} \times X_{ijt}$)).

### 5.2 Heckman selection model

Another way of looking at the zero value problem is the solution proposed by Heckman (1979). This solution amounts to a two-step procedure. The first step is to estimate the probability of

preference eligibility and utilization, using a probit estimator. We thus obtain the following selection equation:

$$Prob(d_{ijt} = 1) = \Phi(\beta_0 + \gamma\ GoodGov_{it} + \ \delta\ Gravity_{it} + \theta\ GSP_{ijt} + \varepsilon_{ijt}) \quad (6)$$

$$d_{ijt} = 1\ \ if\ \ p_{ijt} > 0$$

$$d_{ijt} = 0\ \ if\ \ p_{ijt} = 0 \quad (7)$$

where $p_{ijt}$ is a latent (observed) dummy variable, that takes the value of one if the export flow for a given product was GSP-eligible and the GSP is utilized, and zero if the export flow for a given product is GSP-eligible and the GSP is not utilized. $d_{ijt}$ is an (unobserved) dummy variable equal to unity for those observations that are in the sample, and zero for those that are not. The estimates of the probit model are then used to calculate the inverse Mill's ratio ($\phi/\Phi$) which corresponds to the probability of a selection variable being omitted from the original equation. Here, the institutional quality of a nation depicted by $GoodGov_{it}$ and the standard variables of the gravity equation depicted by $Gravity_{it}$ serve as exclusion restrictions, which affect the selection (GSP eligibility of a country and product and GSP utilization). The inclusion of these variables solves the omitted variable bias and produces estimates that are consistent in the presence of a non-random sample.

In a second step the Heckman selection model estimates an OLS model by means of the inverse Mill's ratio, where the sample is restricted to export flows which are GSP-eligible and where the GSP is utilized. Consequently, we obtain the following outcome equation:

$$\log\ UR_{ijt} = \beta_0 + \theta GSP_{ijt} + \varepsilon_{ijt} > 0 \quad (8)$$

By now, the outcome equation of the Heckman selection model only contains positive values of the utilization rate ($logUR_{ijt}$ is missing *if* $p_{ijt} = 0$) and variables which are exclusively related to the GSP scheme and provide incentives to export under preferential conditions and consequently affect the level of the utilization rate. Once the trade contract is established and the exporter has overcome bureaucratic obstacles associated with the GSP, the outcome equation of the Heckman two-step procedure allows us to obtain an unbiased estimate of the relationship between the utilization rate and the preference margin because Good Governance indicators used in the selection equation solve the selection problem (see Section 4). Consequently, the outcome equation only contains variables which affect the level of the utilization rate once preferences are demanded. Note: We do not integrate interaction terms to identify the DCs' or LDCs' country effect into the Heckman selection model procedure; this is because, in particular, model variations where product fixed effects are included in the model do not achieve convergence.

## 6. Results and discussion

This section provides regression results for the baseline reference estimations from PPML (Subsection 6.1) and the additional robustness check estimations from the Heckman selection model (Subsection 6.2).

### *6.1 Results for Poisson Pseudo maximum likelihood*

Table II presents PPML regression results for the individual Good Governance indicators (WGI, IEF and HDI) without interaction terms, whereas Table III presents PPML regression results with interaction terms to identify the country group effects. To improve clarity, we do not report detailed regression results and therefore focus on the effect of the individual Good Governance indicators. Detailed results with and without interaction terms are available upon request. Furthermore, we do not report results where we simultaneously

integrated time and product fixed effects into the model (corresponding results are likewise available upon request).

The variable "Good Governance", which reflects the WGI, IEF and HDI, shows – over all model variations without interaction terms – the expected positive sign and is highly significant. The results show that the institutional quality of a GSP-benefiting country is supportive for utilizing the GSP. GSP-benefiting countries with high institutional quality are apparently better informed about the options of the Swiss GSP and are better able to overcome the bureaucratic obstacles in the form of proof of origin and proof of direct shipment. In consequence, GSP-benefiting countries with high institutional quality have a high utilization rate and are able to achieve an economic benefit in the form of low tariffs or duty-free market access. This potential economic benefit can lead to competitive advantages in the form of lower prices in comparison with exporters in industrialized countries, which do not benefit from the GSP. The positive effect of "Good Governance" on utilizing trade preferences remains positive when using interaction terms to identify the individual country group effect. For DCs and LDCs, the effect of "Good Governance" is positive across all model variations. However, for the DCs this effect is always highly significant, whereas for the LDCs the effect of the HDI is positive but only significant for the model variation with time and product fixed effects (corresponding detailed regression results are available upon request).

The variables "GSP-eligible trade" and "preference margin" show the expected positive signs and are highly significant. These results support our assumption that the costs of compliance affect the exporter's decision whether or not to demand trade preferences. For instance, a 10 percent increase in the "preference margin" leads to an increase in the utilization rate by on average 1.5 percent. Adding FE to the model intensifies the positive effect of the "preference margin" for all model variations. Likewise, a 10 percent increase in "GSP-eligible trade" leads to a 0.3 percent increase in the "utilization rate." Therefore, trade preferences are demanded in cases where the GSP-eligible trade flow and the preference margin are high. The positive effect of the preference margin and GSP-eligible trade is stronger for the LDCs. This is because LDCs are granted more GSP-eligible tariff lines and higher preference margins than DCs (Ritzel and Kohler, 2017).

The dummy variable "regional cumulation" which focuses on proof of origin, especially for more highly processed products, shows the expected positive sign and is highly significant.

**Table II.**
PPML regression results for Good Governance indicators without interaction terms

| Independent variable | WGI (1) | WGI (2) | IEF (1) | IEF (2) | HDI (1) | HDI (2) |
|---|---|---|---|---|---|---|
| *GoodGov* | 0.325*** (0.030) | 0.382*** (0.031) | 0.525*** (0.083) | 0.611*** (0.087) | 0.562*** (0.055) | 1.018*** (0.065) |
| *Time FE* | No | Yes | No | Yes | No | Yes |
| *Product FE* | No | No | No | No | No | No |
| No. obs. | 26,288 | 26,288 | 26,154 | 26,154 | 25,844 | 25,844 |

**Notes:** Robust standard errors in parentheses. *$p < 10$ percent; **$p < 5$ percent; ***$p < 1$ percent

**Table III.**
PPML regression results for Good Governance indicators using interaction terms

| Independent variable | WGI (1) | WGI (2) | IEF (1) | IEF (2) | HDI (1) | HDI (2) |
|---|---|---|---|---|---|---|
| *GoodGov DCs* | 0.235*** (0.034) | 0.317*** (0.033) | 0.477*** (0.087) | 0.643*** (0.086) | 0.248*** (0.059) | 0.764*** (0.074) |
| *GoodGov LDCs* | 0.299*** (0.073) | 0.300*** (0.072) | 0.895** (0.407) | 0.990** (0.422) | 0.127 (0.152) | 0.187 (0.151) |
| *Time FE* | No | Yes | No | Yes | No | Yes |
| *Product FE* | No | No | No | No | No | No |
| No. obs. | 26,288 | 26,288 | 26,154 | 26,154 | 25,844 | 25,844 |

**Notes:** Robust standard errors in parentheses. *$p < 10$ percent; **$p < 5$ percent; ***$p < 1$ percent

Consequently, a country which is a member of the ASEAN and is therefore covered by the regional cumulation in the Swiss GSP gains a higher utilization rate than countries which are not covered by the regional cumulation. However, the positive effect of this variable is damped but remains statistically significant when time and product FE are added to the model. Product FE in particular allows us to control for such product-related aspects, so that a damping of this variable's effect is the logical consequence. Here again, the positive effect is stronger for the LDCs.

Given that proof of origin is easier to provide for "low processed" products (e.g. commodities), the product-related dummy variables "medium processed" and "highly processed" which likewise focus on the rules of origin (proof of origin) show unexpected positive signs. This implies that the Swiss GSP is better utilized in the case of medium and highly processed products. This could be because medium and highly processed products have higher price and preference margins.

The variable "GDP" is highly significant and shows an unexpected negative sign in the case of the model variation without interaction terms. The variable "population" is likewise significant and shows the expected positive sign. This implies that highly populated DCs and LDCs with low GDP are particularly likely to show high utilization rates, and vice versa. The "poorer" DCs and LDCs are more focused on realizing the above-mentioned economic benefit which results from lower tariffs or duty-free market access. By using interaction terms to identify the individual country group effect of a given independent variable, the picture changes slightly. While the effect of "GDP" remains negative for DCs, "GDP" shows mostly a positive but not always significant effect for LDCs.

The variable "distance", which is an approximation for transport costs, is highly significant and shows an unexpected positive sign in the case of the model variation without interaction terms. This implies that GSP-benefiting countries with a larger distance to Switzerland and hence with higher transport costs have a higher utilization rate than those with a smaller distance. Here again, the effect of "distance" changes when using interaction terms. While the effect of "distance" remains positive for DCs, "distance" consistently shows a positive effect for LDCs.

The variable "common official language" is highly significant and initially shows an unexpected negative sign. Although the presence of at least one common official language in a DC or LDC creates better conditions to deal with bureaucratic obstacles associated with the GSP, it has a negative effect on the level of the utilization rate. However, the picture likewise changes when using interaction terms to identify the country group effect. While the effect of "common official language" remains negative for DCs, "common official language" consistently shows a positive effect for LDCs. This implies that LDCs which have the same official language as Switzerland achieve higher utilization rates than DCs which likewise have the same official language as Switzerland.

At first glance, estimation results concerning the signs of the standard gravity variables are surprising. However, our analysis focuses on the trade performance of the world's poorest countries, so that one cannot expect the same estimation results as in studies analyzing the trade performance of industrialized countries. The relevant literature on evaluations of the effectiveness of PTAs (see Appendix) indicates that thematically similar studies likewise produce ambiguous estimation results.

### *6.2 Results for the Heckman selection model*

Table IV presents regression results of Good Governance indicators for the selection equation of the Heckman selection model where the probability of preference eligibility and utilization is estimated by means of a probit model. Here again, to improve clarity, we do not report detailed regression results and therefore focus on the effect of the individual Good Governance indicators. Detailed results for the selection and outcome equations are

available upon request. Furthermore, we do not report results where we simultaneously integrated time and product FE into the model (corresponding detailed regression results are available upon request).

In general, it can be stated that sample selection bias seems not to be a serious problem. A sample selection only creates bias if the error terms of the selection and outcome equations are correlated. That information is contained in the estimate of $\rho$. An estimate of $\rho$ that is large in absolute values (up to a maximum of one) suggests that the sample selection is a major problem in the data set used. Likewise, the null hypothesis that $\rho$ is equal to zero cannot be rejected. This implies that the error terms of the selection and outcome equations are uncorrelated (this holds true for all model variations).

Results of the selection equation, where the probability of preference eligibility and utilization is estimated by means of a probit model, show the same signs and approximately the same magnitudes of the estimators as indicated by PPML estimations (results of the selection equation are available upon request). Similar to the estimation results of the PPML model, the institutional quality of a nation depicted separately by the WGI, IEF and HDI significantly increases the probability that an exporter overcomes bureaucratic obstacles (proof of origin and proof of direct shipment) and utilizes the GSP.

Results of the outcome equation (corresponding detailed regression results are available upon request) indicate that the positive and highly significant effect of the "preference margin" increases when time and product FE are added to the model. Accordingly, a 10 percent increase in the "preference margin" leads to an increase in the utilization rate by on average 0.9 percent. In contrast to PPML estimations, the variable "GSP-eligible trade" shows an unexpected negative sign and is highly significant. We assume that the size of "GSP-eligible trade" plays a tangential role compared to the "preference margin" when the sample is restricted to positive values of the utilization rate. The variable "regional cumulation" which focuses on the rules of origin shows a negative sign for most of the model variations. However, this negative effect is only significant for the model variation where the WGI is included in the model. The product-related dummy variables "medium processed" and "highly processed" which likewise focus on the rules of origin (proof of origin) show unexpected positive signs. In accordance with PPML results, this likewise implies that the Swiss GSP is better utilized in the case of medium and highly processed products. As mentioned above, this could be because medium and highly processed products have higher price and preference margins.

## 7. Conclusions and policy recommendations

The main objective of this study is to demonstrate that the institutional quality in a nation is an important element in utilizing trade preferences granted to DCs and LDCs. In this context, our results unequivocally indicate that the institutional quality of a nation depicted by the Good Governance indicators is indispensable in order to overcome NTBs in the form of export certificates such as proof of origin and proof of direct shipment. For all model

**Table IV.**
Heckman regression results for Good Governance indicators without interaction terms

| Independent variable | WGI (1) | WGI (2) | IEF (1) | IEF (2) | HDI (1) | HDI (2) |
|---|---|---|---|---|---|---|
| *GoodGov* | 0.171*** (0.023) | 0.209*** (0.024) | 0.683*** (0.077) | 0.716*** (0.078) | 0.423*** (0.047) | 0.657*** (0.054) |
| *Time FE* | No | Yes | No | Yes | No | Yes |
| *Product FE* | No | No | No | No | No | No |
| No. obs. | 26,288 | 26,288 | 26,154 | 26,154 | 25,844 | 25,844 |

**Notes:** Robust standard errors in parentheses. *$p < 10$ percent; **$p < 5$ percent; ***$p < 1$ percent

variations, the variable "Good Governance" shows a significant and positive effect on the level of the utilization rate. Therefore, exporters from a country with high institutional quality are more likely to gain benefits from the GSP than exporters from a country with low institutional quality. Furthermore, our results indicate that "poorer", highly populated DCs and LDCs with high institutional quality and low productivity in the agricultural sector utilize the GSP more often than other DCs and LDCs. By implication, "wealthier", less populated and more productive DCs and LDCs with low institutional quality tend to export under the MFN scheme, where no costs of compliance occur, rather than under the GSP scheme. In particular, the negative effect of the variable GDP is surprising, because this variable is often used as an approximation for the institutional quality of a nation. Consequently, we believe that the GDP is merely an indicator for the economic or export performance of a nation and therefore should be understood as a purely economic performance indicator, which does not capture the institutional quality of a nation.

The "preference margin", which represents the main incentive to export under preferential conditions, compensates the costs of compliance associated with the GSP and causes an additional benefit for the importer, has a consistent and positive effect on the level of the utilization rate. Furthermore, results unequivocally indicate that the GSP is utilized even more in the case of medium and highly processed products. In particular, the application of the Heckman selection model makes it clear that, once trade contracts are established and an exporter has overcome bureaucratic obstacles in the form of proof of origin and proof of direct shipment, the "preference margin" appears as the main incentive to export under preferential conditions granted by the GSP. While the effect of the size of "GSP-eligible trade" has a positive and significant effect in the case of the PPML estimations, the effect turns negative when the sample is restricted to positive values of the utilization rate in the case of the outcome equation of the Heckman selection model. This finding encourages our confidence that the "preference margin" acts as the main incentive for exporting under preferential conditions.

To promote socio-economic development in DCs and LDCs granting unilateral trade preferences is an important element in integrating these countries into the world markets. Unilateral trade preferences and its according reduced tariffs and zero tariffs can be considered as a competitive advantage for DCs and LDCs over competitors from industrialized countries. Especially institutions such as the WTO, the World Bank or the UN emphasize the positive correlation between increasing trade activities and accelerating socio-economic development. Agro-food exports can be regarded as a first step to increase income in DCs and LDCs. In turn, higher incomes enable higher savings which can be translated in higher investments. However, granting unilateral trade preferences via the GSP should not be the only element of Swiss (trade and) development policy. Furthermore, Swiss development policy should also focus on assistance in building production and trade capacity so that DCs and LDCs are able to participate more effectively in international trade. According to the WTO (2017) without assistance in building production and trade capacity "these countries won't be able to expand the quantity and quality of goods and services they can supply to the world markets at competitive prices." Therefore, assistance in building production and trade capacity should encompass investments in human capital, institutional quality and infrastructure (WTO, 2017). Consequently, improved trade-related institutions and infrastructure should put DCs and LDCs in a position to overcome NTBs and to benefit from a competitive advantage resulting from unilateral trade preferences.

## Notes

1. The EU also offers preferential market access for "countries of the western Balkans", Pakistan, and the Republic of Moldova (WTO, 2014).

2. The "coverage rate" is the percentage of products eligible for preferential treatment out of the total number of dutiable products (UNCTAD, 1999).
3. Because the methodology of the EFI is similar to that of the IEF, we refrain from using the EFI in this article.



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## Appendix. Literature survey on the utilization of PTAs

**Table AI.** Relevant literature for regression models explaining the level of the utilization rate as a dependent variable

| Independent variable | Expected effect | Factual effect | Publication |
|---|---|---|---|
| GDP | + | + and − | Manchin (2006) |
| Population | + | + and − | Manchin (2006) |
| GDP per capita | + | + and − | Gasiorek *et al.* (2010) |
| Distance | − | − | Gasiorek *et al.* (2010) |
| Transport costs | − | − | Gasiorek *et al.* (2010) |
| Remoteness | − | − | Hakobyan (2012) |
| Common border | + | + | Gasiorek *et al.* (2010) |
| Former colony | + | + | Gasiorek *et al.* (2010) |
| Common language | + | + and − | Gasiorek *et al.* (2010) |
| Other preference systems | − | − | OECD (2005) |
| Preference margin | + | + | OECD (2005)<br>Manchin (2006)<br>Bureau *et al.* (2007)<br>Gasiorek *et al.* (2010)<br>Keck and Lendle (2012) |
| Preference eligible trade | + | + | OECD (2005)<br>Bureau *et al.* (2007)<br>Nilsson (2012)<br>Keck and Lendle (2012) |
| Regional cumulation | + | + | Hakobyan (2012) |
| Primary product | + | + and − | Nilsson (2012)<br>Keck and Lendle (2012)<br>Hakobyan (2012) |
| Highly processed product | − | + | Bureau *et al.* (2007) |
| Product category | + or − | + and − | Manchin (2006)<br>Nilsson (2012) |
| Institutional quality (EFI) | + | + and − | Manchin (2006) |

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