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Analyzing the Impact of European Generalized System of Preferences (GSP) Plus Scheme on the Exports of Pakistan using a Gravity Model

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Abstract: *The EU granted Pakistan Generalized System of Preferences (GSP) Plus status in 2013, which has been in operation since January 2014. This study seeks to gauge the effectiveness of the GSP-Plus scheme. It evaluates whether or not GSP-Plus has been effective in stimulating the exports of Pakistan to the EU. The study uses exports data of plastic, leather, textile and footwear from Pakistan to 28 EU member countries. From an econometric perspective, taking unobservable country heterogeneity and zero trade flow, we have used a definite measure of margin of preference to measure the effectiveness of GSP-Plus. We have used Poisson-Pseudo Maximum Likelihood (PPML) and Negative Binomial Regression (NBR) estimators. The results obtained revealed that GSP-Plus scheme has been effective in stimulating the exports of Pakistan.*

Keywords: Preference margin; GSP-Plus scheme; Gravity model; PPML; NBR

Introduction

Preferential trade agreements (PTAs) play a key role in influencing the trade policies of developing countries (DCs) in many ways, and the sole purpose of these PTAs are to enhance the production and exports of DCs, and in addition to this, diversification of their economies. Resultantly, this will lead to sustainable growth in these countries. PTAs are considered as incentives in favor of DCs granted by developed countries to import products at preferential rates and, hence, setting a stage for them to compete in international markets.

In this regard, in 1968 the United Nations Conference on Trade and Development (UNCTD) emphasized and delegated the formation of a Generalized System of Tariff Preferences. Under this system, the developed countries would allow preferential market access to imports from DCs. The European Union (EU) adopted the Generalized System of Preferences (GSP) in 1971 for a ten-year period and has been renewed several times. In addition to ordinary GSP, the EU has introduced and implemented other initiatives like GSP-Drug (now named as GSP-Plus and we will use GSP-Plus here onward) and Everything But Arms (EBA). These two initiatives were introduced to address the poorest and most vulnerable countries. The GSP-Plus is an initiative for vulnerable countries classified by the World Bank on income basis, and, to avail the benefits of this scheme the countries should accept and enforce and execute 27 international conventions on environmental protection, human and labor rights, fight against drugs, and good governance. EBA is for the 49 least developed and poorest countries with free access for all products except for arms and ammunition (UNCTAD Handbook, 2009).

There is an extensive literature available on the impact of the EU GSP using gravity model. This model analyzes the trade flow as positively or directly affected by the economic masses and negatively or inversely affected by the distance between them (Tinbergen, 1962). It is evident from the literature that the preferences granted by developed countries have increased the exports of the DCs. The impact of EU GSP has been evaluated by numerous authors using gravity model (see, Sapir, 1981; Oguledo and Macphee, 1994; Nilsson, 2002; Verdeja, 2006; Subramanian & Wei, 2007; Baier & Bergstrand, 2007; Agostion et al. 2008; Cardamone, 2007; Aiello & Demaria, 2010; Aiello & Cardamone, 2011; Cipollina, Laborde, & Salvatici, 2013; Lubinga et al. 2017). These studies have showed a positive effect of GSP scheme, and results are in contrast to the results from other preferential settings. Various studies have analyzed utilization rate for different preferential trade agreements for both the US and EU (Inama, 2004; Wijayasiri, 2007; Nilsson & Dotter, 2012). This low utilization rates of these preferential agreements suggest that these agreements are not fulfilling their purpose for which they have been given to lower income countries. There are certain reasons behind the underutilization of these preferential schemes. Reasons are like Rule of Origin (RoO) [3], administrative cost, cost of compliance and cost for securing certificates.

European Union (EU) granted GSP-Plus status to Pakistan and nine other countries on 13th December 2013. Pakistan received 409 votes in favor for this status. Under this status, Pakistan is able to export 75 products to European market (EU 28-member countries) for next four years and which has been extended for a period of two more years in 2020. Before this development, Pakistan exporters enjoyed concessionary access to European markets.

There are advantages to the economy if properly utilized. This scheme has been already granted to Sri Lanka, Bangladesh and India; all of these countries are the competitor of Pakistan especially in the textile sector. Textile sector is playing the role of backbone in this scenario. Furthermore, it will help to increase the economic growth, massive job creation in the industrial sector, huge attraction of foreign direct investment (FDI), and in the improvement of governance by the implementation of international conventions agreed upon in this scheme (Dawn News, 2013).

There are some possible disadvantages of this scheme, first EU is watching and monitoring Pakistan regarding 27 international conventions on environmental protection, human and labor rights, and good governance. Hence, if any of these conventions are violated at any stage then EU has the right to suspend this status. In addition to this, supply-side constraints are also an issue that we need to overcome. Electricity and gas shortage to export to industry is challenging for Pakistan and if not addresses soundly, we cannot take any benefit from this scheme.

The GSP-Plus scheme is a new initiative in case of Pakistan, there is no empirical analysis using a gravity model. This study has employed gravity model to assess the impact of this scheme on the selected products under this given scheme.

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[3] Rule of origin (RoO) means the benefit of a preferential treatment should go to the beneficial countries. In other words, the product should wholly be produced in the exporting countries and if not then either such products are given entry at higher tariff rates or even phase out their entry.

The objective of the study is to develop export indices for four selected products (plastic, leather, textile garments and footwear) and to assess the effectiveness of GSP-Plus in stimulating exports of plastic, leather, textile garments and footwear over a period of 2012 to 2019. Finally, to evalute the effectiveness of overall GSP-Plus scheme.

I. Related Literature

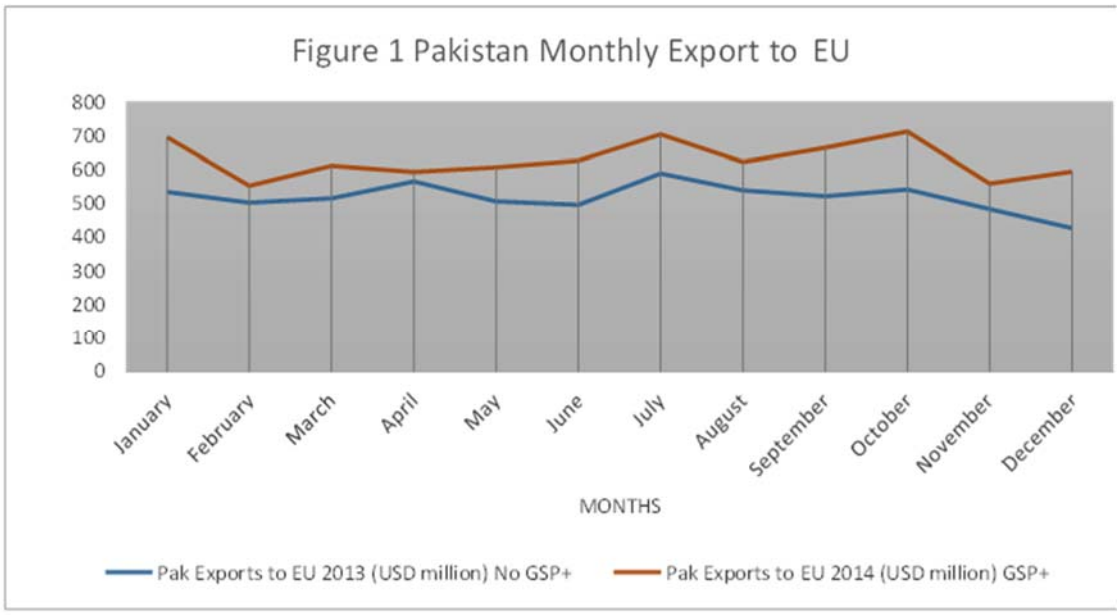
The impact of EU GSP has been evaluated by numerous authors using gravity model (Oguledo & Macphee, 1994; Nilsson, 2002; Verdeja, 2006; Subramanian & Wei, 2007; Cardamone, 2007; Agostion et al. 2008; Aiello & Demaria, 2010; Aiello & Cardamone, 2011). These studies have showed a positive of effect of GSP scheme, and results are in contrast to the results from other preferential settings.

Starting with Sapir (1981) utilized cross-sectional data from the period 1967-1978, his main objective was to find the effect of GSP scheme for products that were manufactured. The results he found was significant and positive for 1973 and 1974. This similar approach was employed by Oguledo and Macphee (1994) to evaluate the effect of GSP, Mediterranean, Lome, agreements for the period 1976. For this model they used dummy variable approach to evaluate the trade creation and trade diversion effects. They concluded that GSP scheme has significant impact on developing countries exports. Nelsson (2002) studied the EU GSP and Lome Convention and found that during the period of 1973-1992, GSP and Lome have significant and positive impact while Mediterranean impact is insignificant. Another study, Verdeja (2006) also analyzed the preferences allowed by the EU like GSP, EuroMedfound that these preferential agreements are beneficial for the least developed countries of the world, mainly the African countries. Subramanian & Wei, (2007) did an impact analysis of GSP and for this study they used an extensive coverage of countries, in this case these countries are more than 170 over the period of 1950-2000. They also concluded that there is significant and positive impact of GSP on the total trade. Cardamone (2007) analyzed the PTAs using monthly data for five products namely, fresh grapes, pears, oranges, mandarins and apples. She restricted her analyses to only five products on monthly basis in order to access the import flows of the EU and also to provide some insight about the protection and tariff fluctuation, as the EU vary tariff on some products like fruits and vegetables just to protect their domestic producers. Agostion et al. (2008) used gravity empirics for the evaluation of impact of nonreciprocal trade preference agreements (NRPTAs), in this study they worked with three level of data aggregation i.e., total exports, total agricultural exports and lastly the export of ten agricultural products categorized at 2-digit aggregation. They concluded that the effect of NRPTAs is significant and positive when they took total trade and total agricultural exports. When they tool 2-digit agricultural data, they found that it is positive for meat and its impact is significant but negative for livestock and sugar sector, while for the remaining products the result was insignificant. Aiello & Demaria, (2010) provide evidence from the EU GSP by evaluating the impact of the GSP, though there are other preferential treatment but the widest of them is the Generalized System of Preferences in terms of product and country coverage. They have used gravity model for the estimation purpose for 769 products which are exported from 169 countries. The time period is from 2001-2004. They have included the concept of preference margin in place of dummy variable to capture the effect of GSP scheme. To measure the margin of preference data on tariff has been exploited. They finally concluded that the EU GSP has a significant and positive impact on agricultural products or exports. Aiello & Cardamone, (2011) did find the impact of Everything But Arms (EBA) using gravity model. It is the only study which analyze one scheme. To sum up, the studies on the GSP scheme appeared to be more generous in terms of product coverage and also when compared with other schemes, similar in nature, offered by the US and Japan. At the same time, there is no effectiveness study using a gravity model in Pakistan.

II. Descriptive analysis of Pakistan's exports to the European Union under GSP-Plus scheme

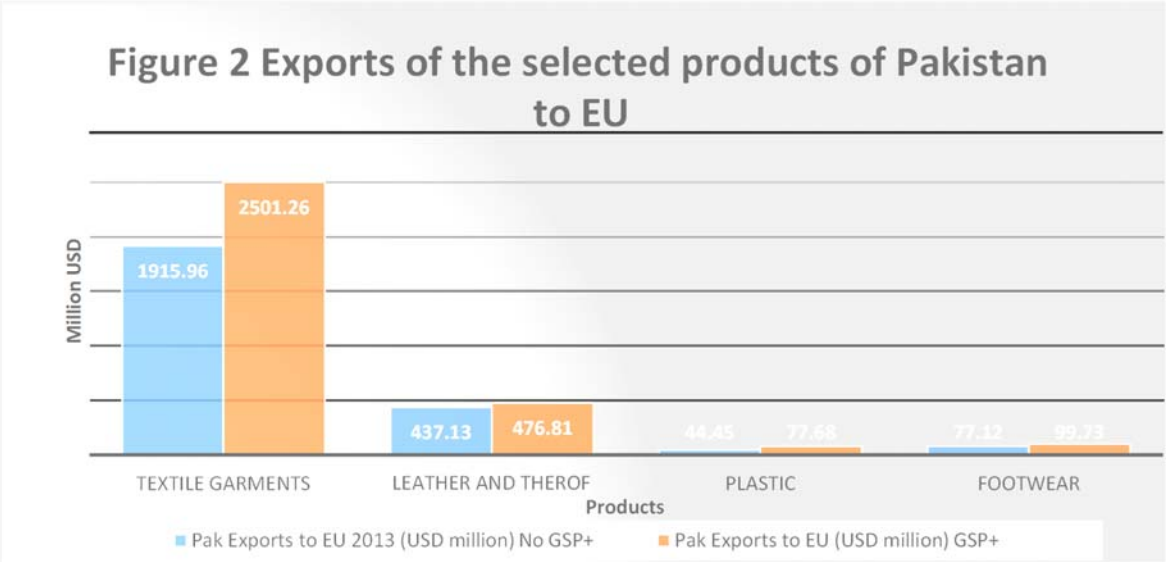
In this section, we present descriptive analysis of exports to the EU under this scheme and we have selected only four aforementioned products because of their concentration in the exports to the EU (Economic survey 2014-19).

In figure 1, we have the monthly exports of Pakistan to EU under GSP-Plus scheme. It emerged from the figure that the exports of Pakistan increased over the period mentioned. In January 2014, the exports increased to EU are 161.10 million USD (about 30%). If we see the overall increase in 2014, it is about 1320.57 million USD and it is about 27% increase as compared with 2013. From this figure, it is clear that the overall exports to EU under GSP-Plus scheme is on rise.



Source: Source: Own computation based on the data from Economic Survey of Pakistan (2014-15)

In figure 2, we have the exports of selected product for this study. As these four products are high concentration in the total export of Pakistan to EU that is the reason these are selected for study. In the figure it is evident that textile exports have increased to 585.30 million USD and it is 30% of the previous year. From this table, it is established that as it is increasing, hence, expected positive impact of GSP-Plus on Pakistan's exports; in textile it positive. Leather and thereof has evident an increase, similarly, plastic and footwear have also shown increase. Thus, it is evident from the figure that GSP-Plus has positive impact on the exports of the selected product.



Source: Own computation based on the data from Economic Survey of Pakistan (2014-19)

III. The Gravity Model

Gravity model is considered as workhouse in international trade. There are various other techniques available for international trade analysis, why gravity model for this study? In the past three to four decades, there are two widely used modelling techniques in trade flow analysis - simulation and econometric models (Jong et al., 2002; Shahid, Baig & Abrar, 2024 and World Bank, 2005). The main difference between the two models is a) econometric model tries to predict future trade flow or trade pattern on the basis of past trade behavior or patterns, whereas b) simulation model attempts and analyze the trade flow and its impact. Furthermore, econometric modelling has underlined gravity model for analyzing the trade flow because of the robustness and simplicity. It is because of these reasons this study has used gravity model.

This model explains the bilateral trade pattern between nations and it states that trade flow is positively or directly affected by the economic mass of the countries involved in the trade and negatively or inversley affected by the geographical distance between them. This represent the normal pattern of trade flow in the absence of any resistance or disturbance (Aiello & Demaria, 2010)

The basic specification of gravity equation employed in this study is as follow:

$$M_{ij}t = \alpha + ß_1 \ln(GDPit) + ß_2 \ln(GDPjt) + ß_3 \ln(POPit) + ß_4 \ln(POPjt) + ß_5 \ln(Dist_{ij})$$

$$+ ß_6 Languageij + ß_7 Colonyij_ij + ß_8(GSP\_Plus_ijt) + u_ijt$$

…… (1)

In equation (1), the subscript i represents the exporter county, which in our case is Pakistan; j represents the importing countries, which in our case are EU-28 countries, t is the time period. $M_{ij}t$ are the exports from i country to j country at time t. The exports are in value and only represent the exports to EU under

GSP-Plus scheme. GDP is the Gross Domestic Product in real form and shows the economic size. It is in log form as traditionally been used; POP is the population of the countries; Dist is the geographical distance between the capitals of the county i and j. Colony is a dummy variable that takes value 1 if county i and j has past colonial ties, and value 0 otherwise. Language is a dummy variable that takes value 1 if the county i and j speak same languages, and value 0 otherwise; u_ijt is the error term.

The key variable of this study is GSP-Plus, which has been addressed in the literature mostly by dummy variables approach. In the dummy variable approach, these preferential trade agreement (PTA) variables like GSP-Plus are given value 1 if the country belong to a given PTA, and value 0 otherwise. It is obvious from this type of analysis that coefficients are expected to be positive because of the fact that preferred countries should export more than non-preferred ones. In addition to this, there is another drawback that is this approach consider all groups homogenous, without taking into account the difference which exist among the groups. Finally, this approach ignores concept like preference margin, quotas and entry prices.

In order to overcome all the above-mentioned shortcoming of the dummy approach, many studies have employed preference margin to access the benefits from preferential scheme (Cardamone, 2009; Aiello & Demaria, 2010). This study also employs preference margin to access the benefit of GSP-Plus scheme in case of Pakistan. Preference margin is defined as: It is difference between most-favored-nation (MFN) rate of tariff and the preferential rate of tariff or duty paid by the ultimate exporter for a like product. $GSP-Plus_ijt$ is the preference margin under the GSP- Plus scheme that country i exports to j at a given time t.

Formula is given as:

Preferential Margin$_i jt$ = MFN$_i jt$ – PREF_TARIFF$_i jt$ (2)

MFN is most favored nation tariff rate and PREF_TATIFF is preferential applied tariff rate under specific agreement. In this study, we are considering four products namely textile, leather, footwear and plastic. Higher the preference margin higher will be the benefit from a said preferential treatment and in our case, it is GSP-Plus scheme. To achieve the objective of the study panel data has been selected and time period is from 2012 to 2019.

IV. Econometric issues

From literature three econometric issues are identified which are to be addressed because ignoring them would lead to seriously misleading and bias estimates. These include non-observable country heterogeneity, endogeneity and sample selection biasness.

Heterogeneity refers to both observable and unobservable country-specific effects that alter the course of bilateral trade flow between and among countries[4]. It is a fact that no single country is same or homogenous in nature and this is what makes them different with unique set of demands and supply. Furthermore, they have unique factors of production and specialization in various sector of production. Omission of these factors leads to misspecification of the gravity equation and thus leads to inconsistent and biased estimates. Unobservable factors are like historical linkage and cultural ties, which are having the power of proximity in trade. Several other aspects like common language, shared-border and past colonial ties also have impact on the trade. Fixed effect model for observable factors while controlling for unobservable factors. Furthermore, dummy variables are used for observable factors and decomposition of the error term (Serlenga & Shin, 2007).

Second issue is that of endogeneity, there is a possibility that whether preferential trade agreements (PTA) are causing the deviation in trade flow or nation trade more as they are in trade relation without any agreement and this trade relation leads to the formation of these preferential agreements. Thus, from the literature it is evident that there is a two-way causation here and this leads to the problem of endogeneity. To overcome this issue of endogeneity literature suggests various tests, as Davidson-

Mackinnon (DM) endogeneity test and the Durnin-Wu-Hauman test (Agostion et al., 2008, Shahid, Baig & Abrar, 2024 and Stender & Vogel 2023)

Third issue is of sample selection, as zero-trade flows are frequent in trade data. This issue has been addressed in the literature on gravity (Stender & Vogel 2023, Silva & Tenreyro, 2013; Cardamone, 2007; Aiello & Demaria, 2010). Traditionally, log linearized version of gravity equation has been used to overcome this issue of sample selection bias. However, this technique does not achieve the desired results because of the presence of zero trade flows or observations. In bilateral trade, zeros are frequent as an exporting country could not produces all the products required by the importing country, and/or countries do not have high demand for all available products. Silva & Tenreyro, (2013) in order to address the issue of zero trade flow, have used the multiplicative gravity equation instead of log linearized form of the gravity equation. For them it is more appropriate than a log linear gravity equation because in its log linear form there is bias in elasticities. In the same vein, log linearization changes the properties of error term because the original error terms of a multiplicative form are heteroskedastic in nature. The expected value of logarithm of a random variable is influenced by the mean and variance. Now, if the variance of the error term depends on the independent

[4] There are certain possible factors that have propensity to influence the export and/or imports or both of nations in bilateral trade relation. These factors are independent of GDP and time, called the invariant factors like language, border, and culture. In addition, countries also experience business cycles effects that vary over times and only country specific.

variable or repressors, then this will lead to inconsistency in the OLS. Thus, in order to avoid inconsistent estimates, they have employed a multiplicative gravity model. Poisson pseudo-maximum-likelihood (PPML) estimator has been used to address zero trade flow and heteroscedasticity.

Aiello & Demaria, (2010) argued that in Poisson model there is condition of equi-dispersion, it means that this model takes equal mean and variance of the dependent variable. Furthermore, the Poisson model only take into account the observed heterogeneity, and this excludes the unobserved heterogeneity, which is because of the omitted factors. To overcome over-dispersion, negative binomial regression (NBR) could be employed.

To sum up, we have evaluated the preference under GSP-Plus scheme using two different estimators namely, PPML and NBR.

V. Results

This section has summarized the results obtained when estimating equation (1) with PPML and NBR estimators. Table 1 presents the estimates of the selected products under scrutiny; our evidence is consistent with results obtained in the previous studies. Here, we have four main columns, one for each product and then each product's impact has been estimated by two estimators, namely, PPML and NBR. The estimated impact of the European Union GSP-Plus on the exports of the Pakistan varies across the products. Taking into consideration the expected sign of the standard gravity variables, the expected sign or the impact of population is positive, as it has been evident from the literature that larger countries trade more. However, an exporter country may export less to satisfy domestic demand when its own population is large (Oguledo & Macphee, 1994). On the other hand, we may define it from the importer's perspective, that is, as large country may either import less to promote its local industry, or import more to satisfy demand, which she cannot achieve with it domestic production (Pusterla, 2007). By comparing the outcomes, it emerges that the estimated parameters different both in sign and magnitude. More specifically, by focusing on the standard variables of the gravity model, we found that elasticity of the exporting country GDP is negative and statistically significant for leather, textile and footwear, expect for footwear (PPML), which is positive and not significant and it is not significant and negative in case of plastic, on the other hand, the elasticity of the importing county GDP is positive and

statistically significant in PPLM and NBR (in all column). The population of the exporting country is positive and statistically significant for textile and footwear, while positive but not significant for plastic and leather. On the other hand, population of the importing country has an ambiguous sign. Distance has the expected sign (negative) and is statistically significant expect in case of textile that is positive (PPML). Dummy variables - language and colony - has mixed sign, positive and negative for these products though the impact is significant.

Finally, our key variable, that is, GSP-Plus, it is evident from the result that GSP-Plus scheme has a positive and significant impact on the export of the selected products from Pakistan to European market in all regression except in PPMP (leather) and NBR (textile). Briefly, in case of plastic and textile the significance is at the 10% level both in PPML regression. With respect to the preferential margin, the coefficient for GSP-Plus presents positive and significant coefficient for plastic (1.90), leather (1.02), textile (.045) and footwear (.370). The p-value shows the overall significance of the model and show no misspecification in the model.

To sum up the results obtained, it may be argued that the analysis of sector-by-sector impact shows that GSP-Plus has stimulated the exports of plastic, leather, textile and footwear. We may say that GSP-Plus scheme is effective overall as the results indicates.

Table 1: Estimates of the multiplicative specification of the gravity model. Dependent Variable: exports in levels (2012 to 2019)

	Plastic		Leather		Textile		Footwear	
	PPML	NBR	PPML	NBR	PPML	NBR	PPML	NBR
GDP EXPORTER	-.064 (3.98)	-1.89 (2.73)	-3.22 (7.10)	-7.14 ** (2.14)	-11.4 * (.232)	-14.7 ** (5.16)	.464 (1.73)	-7.36 ** (2.64)
GDP IMPORTER	.696 ** (.255)	.755** (.231)	1.58 ** (.243)	.518 ** (.208)	1.12 * (.005)	.493 ** (.259)	1.47 * (.064)	1.17 ** (.191)
POP EXPORTER	8.69 (18.4)	10.3 (8.77)	19.2 (28.1)	7.02 (8.72)	43.9 ** (1.20)	58.9 ** (23.9)	-4.24 (6.42)	14.2 * (8.33)
POP IMPORTER	.348 (.303)	.116 (.211)	-.018 ** (.007)	.017 * (.010)	-.024 * (.0002)	-.004 (.014)	-.006 (.057)	.286 (.313)
DISTANCE	-3.55 ** (1.00)	-3.72 ** (1.58)	-2.31 (1.82)	-3.15 ** (1.49)	5.00 * (.027)	-5.03 ** (2.08)	-3.23 ** (.729)	-.908 (1.07)
LANGUAGE	-1.44 ** (.316)	-2.13 ** (.655)	-2.06 ** (.493)	2.58 ** (.791)	-3.20 ** (.041)	2.30 ** (.924)	-.327 (.227)	-.419 (.221)
COLONY	1.15 ** (.364)	1.40 ** (.707)	-.635 (.570)	-1.97 * (1.09)	3.43 ** (.042)	3.95 ** (.837)	-.075 (.244)	.963 (1.10)
GSP_PLUS	1.90 * (1.36)	1.28 (1.06	-.012 (2.08)	1.02 ** (.525)	.045 * (.018)	-.288 (.307)	.370 ** (.166)	.646 ** (.179)
CONSTANT	8.06*	-36.1	-63.4	25.1	-208.5 **	-265.2 **	45.1 *	31.4
	(76.7)	(37.3)	(121.2)	(39.5)	(5.00)	(103.3)	(28.5)	(25.0)
OBESERVATIONS	108	108	108	108	108	108	108	108
MAX. LIKELIHOOD	-159600000	-1124.3766	-266286.24	-785.79084	-84019.295	-453.69367	-30147.37	-533.36923
P-Values	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

*Note: Standard error in parenthesis. *, **, *** denote statistical significance at 10%, 5% and 1% levels, respectively*

VI. Conclusion

The purpose of this study was to access the effectiveness of GSP-Plus scheme. In addition to this, to access effectiveness of GSP-Plus scheme in stimulating exports of plastic, leather, textile and footwear

over a period of 2012 to 2019. The sample of commodities are selected based on their concentration or share in the exports of Pakistan to European Union (EU) under GSP-Plus scheme mentioned in the Economic survey of Pakistan (2014-15). From the literature on EU GSP, it is evident that the preferential treatment agreements do not achieve its objectives for which it was initiated. There are reasons that includes restrictive rule of origin (RoO), difficulty in compliance with certifications, high administrative cost. These conditions undermine the potential of these sort of agreements. The effectiveness of EU GSP has been analyzed using dummy variable approach widely, ignoring tariff rates and sectoral data.

This study explicitly evaluates the impact of EU GSP-Plus using gravity model by employing sectoral data on commodities under scrutiny. This study used the preferential margin technique to calculate the benefits from this scheme. The aim is to contribute to the literature by providing evidences from an individual country. This study employed Poisson and Negative Binominal Regression (NBR) procedures for our analysis because of the presence of zero trade values in trade statistics, and omitting these values mean omitting handful knowledge. The main finding of this study is as follow: there is a positive impact of GSP-Plus on the export of plastic and is significant at 5%. Leather exports has been affected positively by GSP-Plus and is also significant at 5%. Textile is significant at 10% and there is positive impact of GSP-Plus on the exports of footwear at 5%. Based on the products under scrutiny, we may conclude that GSP- Plus is effective initiative in case of Pakistan.

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