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**Article**

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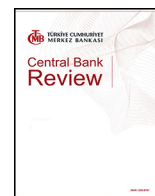
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# Analysis of the impacts of safeguard actions: Evidence from Turkey

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## ABSTRACT

This article analyses Turkey's safeguard (SG) actions using a renovated approach to the measurement of the impacts of the SG duties with empirical application introduced by Bown and McCulloch (2004). We examine the trade impacts of 16 safeguard duties, covering 52 different 4 and 6-digit Harmonized System (HS) product categories, implemented by Turkey between 2003 and 2013, and we aim to reveal whether these measures had discriminatory impacts on those trading partners, whose imports represented a threat to the domestic importing industry. Since Turkish applications of SGs vary widely in terms of their duration, target markets and forms, this makes Turkey an interesting case study for 2003–2013 period, as Turkey mostly used SG applications based on additional financial obligations, not in the form of quotas after 2014. The empirical methodology is based on the approach introduced by Bown and McCulloch (2004), which serves as an attempt to approximate dynamic specifications in the context of cross-sectional data. Our findings show that the SGs applied by Turkey during the period of 2003–2013 effectively had a discriminatory impact on imports from major trading partners, and quotas and tariff rate quotas were more effective than tariffs for restricting imports.

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## 1. Introduction

SG duties are types of trade remedies that World Trade Organization (WTO) members may apply in order to restrict the flows of imports of a good temporarily which might eventually harm a specific domestic industry. The rise in imports should be *sudden, recent, significant and sharp*, and shall trigger injuries to occur over the domestic industries.<sup>1</sup> In this respect, this paper is based on evaluating the effects of Turkey's safeguard actions.

In spite of the fact that there are numerous studies on analyzing the influence of SG policies on international trade so far, we think that gaps still remain in the literature. To illustrate it, impacts of the SG measures on developing economies warrant attention. In this context, one of motives behind this research is that there is a limited evidence showing actual trade impacts of SG actions over Turkish trade. We aim to find out whether specific forms of Turkey's SG duties influence Turkey's actual trade and relations with the trade partners, by answering following research question: *Did different types of SGs applied by Turkey have discriminatory impacts*

*over its trading partners between 2003 and 2013?* To answer this question, we rely on the model introduced by Bown and McCulloch (2004).<sup>2</sup> We examine impacts of 16 safeguard actions applied by Turkey between 2003 and 2013, which cover 52 different 4 and 6-digit HS product and product categories. Although the study does not use a novel method or invent a new understanding for the general subject in hand, we think it provides an important case study and contributes to the literature that way.

Considering Turkey is a developing country using trade remedies frequently, this paper motivates the choice of Turkey among other developing countries since the knowledge out of our study can be applied on trade policy actions other similar countries. The study is based on the data covering the period 2003–2013. The reason why this time interval has been taken into consideration is that Turkey implemented numerous and different types of SG investigations during this period while after 2014, Turkey mostly used SG applications based on *additional financial obligations*.

We normally expect all types of SG instruments to have non-discriminatory basis and follow most-favored-nation (MFN) principle, meaning that the use of SG measures as a policy instrument

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<sup>1</sup> [https://www.wto.org/english/tratop\\_e/safeg\\_e/safeg\\_info\\_e.htm](https://www.wto.org/english/tratop_e/safeg_e/safeg_info_e.htm).

<sup>2</sup> Our study focuses on the country level data rather than firm level data. The data and codes are available upon request.

does not discriminate among the trading partners regardless of whether the SG form is quota, tariff or tariff rate quotas. However, the situation in real practices is totally different. This paper focuses on ways that SG types and policies provoke explicit or implicit discrimination among the partners. First, SGs can spark off discrimination over the new entrants and emerging exporters in the import markets as they can be excluded from the competition following strict SG actions, particularly via quotas. Second, quotas and quantitative restrictions might be harmful for the foreign suppliers whose historical market shares are lower than the others, while tariffs can be less discriminative as they are implemented likewise for the exporters. As a third point, the exporters which are exempted from SG actions through developing status or preferential trade agreements might gain more market share when compared to non-exempted exporters. We use actual Turkish SG cases to understand whether Turkish applications were discriminative among the exporters or not.

The study is organized as follows: Section 1 introduces the literature review highlighting gaps, Section 2 provides information on Turkey's SG applications in general, Section 3 contains econometric formulation, Section 4 empirical findings, and last section conveys the conclusions.

## 2. Literature review

The subject on how to protect domestic industries from unfair practices of foreign competition continues to attract theoretical and empirical research as numerous studies concentrated on the effects of trade remedies by developed countries such as USA, the European Union (EU) and Canada (Hufbauer and Suominen, 2012) while there were some studies analyzing trade policy actions by developing countries. (Koul, 2018).

There is still a room to investigate whether the choice and forms of trade remedies really affect actual trade as the effects of trade policy actions such as antidumping (AD) and countervailing duties (CVD) and SG on trade can differ between cases and countries (Hoekman and Mavroidis, 2016; Moore and Mark, 2015). The impacts seem to depend on the following: magnitude of the measures, structure of the national markets, specialties of the goods subject to remedies, nature of trade policies, trade relations between the exporting and duty-imposing countries, time spans that trade remedies remain in force, and the selections by the companies and countries whose exports will be subject to trade restrictions (Hoekman and Mavroidis, 2016; Moore and Mark, 2015).

Recently, the nature of trade remedies have been investigated empirically using numerous methods for exploring the characteristics of these actions (Hoekman and Nicita, 2011; Hoekman et al., 2017). The number studies that focus on SG actions, however, are still limited when compared with the other trade policy actions like AD and CVD. According to Bown and McCulloch (2004), some scholars incline to focus more on either government or the industry level decisions to apply SG measures as protection measures when compared to other forms of trade policy actions, or government replies to petitions from the industry and the decision whether to grant protection.

One milestone research on SG cases is by Baldwin and Steagall (1994), which evaluated the economic drivers that clarify the decisions emitted by the United States International Trade Commission (USITC) concerning the petitions submitted by domestic industry in USA in relation to trade remedies during the eighties. Authors used data from SG cases in USA between 1975 and 1988, and estimated a Probit model aiming to forecast the probability that the ITC will take decisions in support of or against national industries taking the petitions into account.

Hansen and Prusa (1995) explained the reasons why domestic

industries in USA seek to be protected from unfair trade practices mostly through AD and CVD but not by SG duties between 1958 and 1991. They also compared the application of these measures during the 80s'.

The study by Bown and McCulloch (2004) proposed one of the first comprehensive empirical analysis regarding SGs initiated under WTO's Agreement on Safeguards (AoS). The authors examined actual trade impacts of 14 SG actions which involves 85 6-digit HS product categories which were applied by WTO members in 1995–2000 period. Their findings were twofold: Quotas tend to preserve historical market shares more than tariffs, and effects of SG are contingent upon the specific types of SG policies.

Bown and Crowley (2013) determined that Technical Barriers to Trade (TTBs) like AD and SG measures as responding to terms-of-trade pressure to increase degrees of import protection following Bagwell and Staiger's (1990) repeated game method concerning self-enforcing trade agreements. The authors based their studies on industry-level evidences from US' use of AD and SG measures for the period of 1997 and 2006.

Focusing on the power of SG actions allowing countries to discriminate between the foreign suppliers, Bown and Crowley (2016) asserted that the application of specific SG duties is praiseworthy since these actions were created by AoS to be less discriminatory when compared to CVD and AD. The authors emphasized that the implementation of SG duties favours governments' political actions to discriminate among the foreign suppliers, i.e. choosing a low-priced trading partner while restricting a high-priced trading partner.

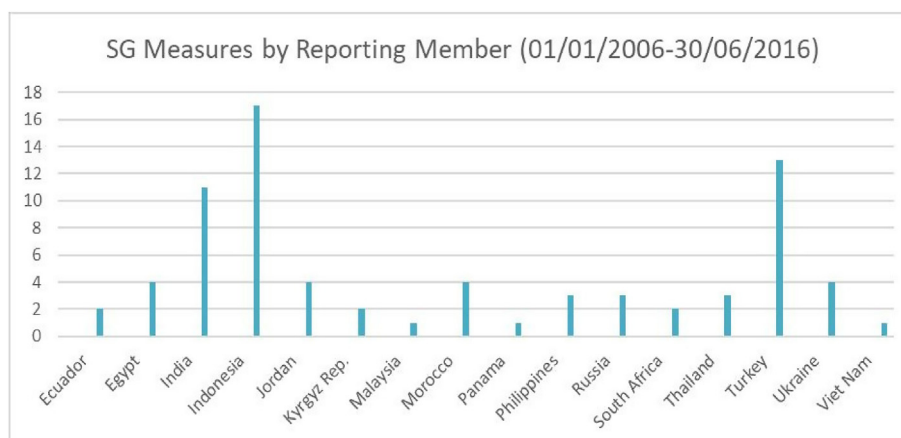
Concerning the increase in the use of trade remedies as trade policies, Bown (2018) specified that the protection policies used by G20 economies, particularly post-1995 period, moved more to the implementation of TTB actions of SG, CVD and AD.<sup>3</sup>

Turkish applications of trade policy instruments were also discussed widely in the literature. Limão and Tovar (2011) developed a theoretical model and examined tariff commitments of Turkey during the mid-1990s and found that mentioned commitments augmented the restrictiveness and likelihood of subsequent non-tariff barriers actions by the country.

Karacaovali (2011) investigated the use of trade remedies by Turkey between 1990 and 2009. The author based his analysis on temporary trade barriers database by World Bank (WB) and provided an extensive research on how often Turkey used SG actions during the mentioned time span. Karacaovali showed that in relation to the SG, of 12 of these measures imposed in 2005, 2 expired in 2008; 5 had not yet expired in 2010; 4 that were supposed to expire in 2009 were extended to 2012; and 1 that was supposed to expire in 2009 was removed in 2010. According to the author, this demonstrated Turkey's lack of commitment to remove measures within the agreed lapse of time.

Apart from this, very few empirical studies explored the impacts of SG measures on Turkey's trade. In an interesting study, Bown (2013a,b) investigated the data illustrating how Turkey exercised and administered a flexible trade policy during the period 2008–2011. Rolling the same database by WB, Bown (2013a,b) revealed that the share of Turkey's trade impacted by the AD and SG actions over Turkey's overall trade surged starting with the 21st century. Bown (2013a,b) estimated that 6.4% of import product lines and 4.4% of the value of Turkey's manufacturing imports were affected by these trade policies in 2011. Besides, the author asserted that the durations of SG and AD duties were generally prolonged in line with this flexibility of trade policy argument. In his paper, Bown (2013a,b) also mentioned that Turkey frequently extended

<sup>3</sup> For more information, see Bown (2016).



**Fig. 1.** Number of SG Actions by Reporting WTO Members, January 1, 2006–June 30, 2016  
Source: Authors' calculations using the data at [https://www.wto.org/english/tratop\\_e/safeg\\_e/safeg\\_e.htm](https://www.wto.org/english/tratop_e/safeg_e/safeg_e.htm).

the durations of originally applied SG and ADs well beyond the point at which they were expected to be removed under WTO rules, in addition to the shifts in the product coverage from under one policy to another.

A leading paper on Turkey's SG implementations at sectoral level was by [Bown et al. \(2015\)](#), which concentrated on Turkish SG duties on imports of footwear. The authors found that Turkey applied SGs either as price undertakings (based on minimum price thresholds) or specific duties while these actions could be more discriminatory over the foreign sources.

Although various research have been done with respect to influences of SG duties on country level trade, gaps still remain requiring further attention for Turkish applications since there exists limited empirical evidence pertaining to impacts of SG measures on Turkish trade. The study differs from others in such a way that it analyzes SG applications from an empirical perspective using a time frame when Turkey was active applying different types of actions including tariffs, quotas and tariff rate quotas. After 2013, Turkey mostly used SG applications based on *additional financial obligations* (i.e. *tariffs*), not in the form of quotas.<sup>4</sup> Although the study does not use a novel method or invent a new understanding for the general subject in hand, we think it provides an important case study and contributes to the literature that way. Our study is one of the first empirical analysis targeting to measure effectiveness of different types of Turkish SG actions in a 10 years' time slot, during a time when Turkey frequently used all types of trade remedy actions.

### 3. Turkey's SG actions at a Glance

Turkish SG policies vary in terms of forms, target markets and durations, which makes Turkey an interesting case. For the sake of the study, we decided to focus on time interval 2003–2013 since Turkey was active on applying SG duties during this period.

Turkey ranked the second in the list of countries which apply the SG measures the most between 2006 and 2016 following Indonesia, as can be seen at [Fig. 1](#).

We cover Turkish SG duties between 2003 and 2013 for our study. [Table 1](#) provides details about the SG actions in consideration: initiation year of the SG investigations, the year in which the duty was applied, the year the duty was removed and the expected year of removal, for 16 product/product groups under consideration.

<sup>4</sup> The major reason why this study focuses on the period before 2014 is that there are few SGs after 2014, which are in the form of quotas, which restricts to compare the types of SG actions and their effectiveness after 2013.

The information concerning SG duties were gathered using Turkey's notifications to the WTO Committee on SG, and Turkish Official Gazette. The disaggregated import data were compiled from the United Nation's (UN) Comtrade database. In total, 52 different 4 and 6-digit HS products were analyzed in this study.

[Table 2](#) below gives information on HS codes of the products subject to SG measures by Turkey. The HS codes of the products reveal that some of SG measures were taken against only one product with a specific HS code (see HS code for polyethylene terephthalate) while some measures covered products groups with different HS codes (i.e. travel goods, handbags and similar containers).<sup>5</sup> It is also seen that some measures remained in force only for 3 years while some were extended to 8 years or even longer.

### 4. Econometric formulation

We use [Bown and McCulloch \(2004\)](#)'s methodology to estimate the econometric specification, which suggests two main equations that have been used in the assessment of the discriminatory impacts derived from the implementation of SG duties.

For both of the equations denoted as 3.1 and 3.2 below, as [Bown and McCulloch \(2004\)](#) suggested, the year in which the SG measure was adopted is denoted by  $t_0$ ;  $b$  denotes the exporter country of the commodity  $a$  that the country imposing the SG measure has determined to protect. The first equation to be estimated is as follows:

$$M_{a,b;t_0+1} = \alpha_0 + \alpha_1 \bar{M}_{a,b} + \sum_{k=1}^2 \alpha_{2k} (\tau_k \bar{M}_{a,b}) + \alpha_3 \Delta M_{a,b;t_0-1} + \sum_{k=1}^2 \alpha_{4k} (\tau_k \Delta M_{a,b;t_0-1}) + \alpha_5 R_b + \alpha_6 X_{a,b;t_0+1} + \alpha_7 Z_{a,b;t_0+1} + \varepsilon_{t_0+1} \quad (3.1)$$

The dependent variable  $M_{a,b;t_0+1}$  represents the share of exports from country  $b$ 's in total imports from Turkey (of the product  $a$ ) in the year  $(t_0+1)$ .<sup>7</sup> We use  $t_0+1$  since the impact of the SG intervention is more likely to be seen in the following year if it is

<sup>5</sup> In this study, 3 types of SG duties are explored: Tariffs, quotas, or tariff-rate quotas. We normally expect these instruments to have non-discriminatory basis. [Appendix B](#) instructs on the types of the SG measures with relevant HS Codes.

<sup>7</sup> Note that in essence the shares of exports within Turkey's imports are calculated from a sample of countries; in that sense it is not a time series, but a cross-sectional variable.

**Table 1**  
Safeguard measures applied by Turkey, 2003–2013.

Products and Product Groups	Year of Initiation	Year of Final Measure	Year of Expected Removal	Year of Removal
Activated Earth and Clays (Group 8)	2004	2005	2008	2008
Voltmeters and Ammeters (Group 10)	2004	2005	2008	2008
Footwear (Group 4)	2006	2006	2009	2014
Salt (Group 6)	2006	2006	2009	2009
Vacuum Cleaners (Group 12)	2006	2006	2009	2012
Steam Smoothing Irons (Group 13)	2006	2006	2009	2012
Motorcycles (Group 14)	2006	2007	2010	2015
Frames and Mounting for Spectacles (Group 5)	2007	2008	2011	2016
Travel Goods, Handbags and Containers (Group 2)	2007	2008	2011	2016
Certain Electrical Appliances (Group 11)	2007	2008	2011	2015
Cotton Yarn (Group 3)	2008	2008	2011	2012
Float Glass (Groups 15, 16)	2003	2006	2009	2012
Polyethylene Terephthalate (Group 9)	2011	2011	2014	2017
Terephthalic Acid (Group 7)	2013	2013	2016	2014
Matches (Group 1)	2008	2005	2008	2008

Source: Author's calculations.

**Table 2**  
SG duties by Turkey, 2003–2013, with HS codes.<sup>61</sup>

Group Numbers	HS Codes
<b>Group 1</b>	3605
<b>Group 2</b>	4202, 4202.11, 4202.12, 4202.19, 4202.21, 4202.22, 4202.29, 4202.31, 4202.32, 4202.39, 4202.91, 4202.92, 4202.99.
<b>Group 3</b>	5205, 5205.12, 5205.22, 5205.32, 5205.42.
<b>Group 4</b>	6402, 6403, 6404, 6402.99, 6403.51, 6403.59, 6403.91, 6403.99, 6404.19, 6404.20.
<b>Group 5</b>	9003, 9003.11, 9003.19.
<b>Group 6</b>	2501.00.
<b>Group 7</b>	2917.36.
<b>Group 8</b>	3802.90.
<b>Group 9</b>	3907.60.
<b>Group 10</b>	8504.31, 9030.39.
<b>Group 11</b>	8508.11, 8509.40, 8509.80, 8516.31, 8516.60, 8516.72, 8516.79.
<b>Group 12</b>	8509.10.
<b>Group 13</b>	8516.40.
<b>Group 14</b>	8711.10, 8711.20, 8711.30.
<b>Group 15</b>	7004, 7005.
<b>Group 16</b>	7005.

Source: Author's calculations.

applied in year  $t_0$ . To provide an example, some of Turkey's SG applications were implemented in the year 2006 as their dismantling date, so  $t_0 = 2006$  was selected for the actions.

The specification in (3.1) has no direct justification in terms of economic theory; its justification is empirical in nature. It was indeed an attempt by Bown and McCulloch (2004) to approximate a dynamic specification in the context of data that are essentially cross-sectional.

The fundamental variable depicts the historical market share of country  $b$ 's exports in Turkey's imports ( $\bar{M}_{a,b}$ ),<sup>8</sup> which approximates the trend of the shares ( $M_{a,b;t}$ ) in the previous three years ( $t-1, t-2, t-3$ ) while Turkey applied the SG duty. As a result, its inclusion as an explanatory variable seeks to decide to what degree the recent past will determine the future share of the country subject to the SG intervention in Turkey's imports.

<sup>8</sup> See Appendix A for the calculation of  $\bar{M}_{a,b}$  which is the variable showing historical market share. Since SGs are generally in effect for three years, the average is calculated using three years prior to the imposition of the SGs. The results are not expected to change when taking different number years into account since historical market shares of Turkish imports have not changed much in the previous years.

Given that  $\tau_k$  ( $k = 1, 2$ ) represent a dummy variable that establishes whether the SG duty that was implemented to a country in the sample is a tariff or a combination of quota and tariff (i.e. Tariff Rate Quotas), the inclusion of the interactions  $\tau_k \bar{M}_{a,b}$  ( $k = 1, 2$ ) allows us to predict the differential trend effect of SG duties taken into account when it comes to the dependent variable. Apart from that, the variable  $\Delta M_{a,b;t}$  measures the trend market gain or loss of the exporting country on which Turkey applied the SG duty; thus, its inclusion as an explanatory variable aims to see how much the exporting country's (on which the SG duty is imposed) recent market gain or loss would determine its future share in Turkey's imports. The interactions  $\tau_k \Delta \bar{M}_{a,b}$  ( $k = 1, 2$ ) allow estimating the effect of the exporting country's market gains or losses on the dependent variable when SG measures under consideration are imposed.

Equation (3.2), which is the second specification given below, is essentially the same with Equation (3.1). In Equation (3.2), only the dependent variable varies, which is the trend market gain or loss of the country on which Turkey imposes SGs. Besides, other control variables are additionally included.

The second specification can be found below:

$$\begin{aligned} \Delta M_{a,b;t_0+1} = & \beta_0 + \beta_1 \bar{M}_{a,b} + \sum_{k=1}^2 \beta_{2k} (\tau_k \bar{M}_{a,b}) + \beta_3 \Delta M_{a,b;t_0-1} \\ & + \sum_{k=1}^2 \beta_{4k} (\tau_k \Delta M_{a,b;t_0-1}) + \beta_5 E_b + \beta_6 I_{PTA} E_b + \beta_7 R_b \\ & + \beta_8 \Delta X_{a,b;t_0+1} + \beta_9 Z_{a,b;t_0+1} + v_{t_0+1} \end{aligned} \quad (3.2)$$

The dependent variable  $\Delta M_{a,b;t_0+1}$  measures the percentage change in the share of country  $b$ 's exports in Turkey's total imports of the product  $a$ , between year  $t_0-1$  and year  $t_0+1$ . Explanatory variables  $\bar{M}_{a,b}$ ,  $\tau_k$ ,  $\Delta M_{a,b;t_0-1}$ ,  $R_b$  and  $Z_{a,b;t_0+1}$  are defined as in equation (3.1).<sup>9</sup>

With regard to the distributional assumptions of the error term, the OLS estimator is asymptotically normal in large samples and our working sample was 2572 observations. No adjustments were made for heteroscedasticity because it is a cross-section regression most of the methods of adjustment to use also adjust for

<sup>9</sup> Formulas, which show how variables  $\bar{M}_{a,b}$ ,  $\Delta M_{a,b;t_0+1}$ ,  $\Delta M_{a,b;t_0-1}$  are constructed, can be found at Appendix A.



autocorrelation, which would introduce distortions in a cross-section regression.

#### 4.1. Justification of variables (and expected signs) in Equation 3.1

The explanatory variable  $\bar{M}_{a,b}$  approximates the historical market share of country  $b$  exports in Turkey's imports for the period of three years prior to the imposition of the SG (i.e.,  $t_0-3, t_0-2, t_0-1$ ). This variable reflects the inertia of the dependent variable; for this reason, it is supposed to be related to the dependent variable in a direct manner ( $\alpha_1 > 0$ ). Interactions of this variable with SG actions ( $\tau_k \in \{\text{tariff}, \text{TRQ}\}$ )<sup>10</sup> are expected to have a positive relationship with the dependent (i.e.,  $\alpha_{2k} > 0, k = 1, 2$ ). These differential effects of SG duties on exporters is captured using these variables.<sup>11</sup>

The predictor variable  $\Delta M_{a,b;t_0-1}$  gauges the percentage change in the share of country  $b$ 's exports in Turkey's total imports (of the product  $a$ ) between year  $t_0-3$  and year  $t_0-1$ . This variable approximates the gain or loss of market of the exporter country in the period prior to the application of the SG; and the expected sign of this variable is positive ( $\alpha_3 > 0$ ), that is, if the exports of a country gain market in the period prior to the SG, these should have a larger market share in  $t_0+1$ , when remaining variables are kept constant. In addition to this, the interactions of this variable with SG duties  $\tau_k \in \{\text{TRQ}, \text{tariff}\}$  are presented as explanatory to estimate the differential impacts of SG policies on market gain. The expected sign is positive ( $\alpha_{4k} > 0, k = 1, 2$ ).

The explanatory variable  $Rb$  shows the retaliation capacity of the exporter country  $b$ . This variable is designated as the share of country  $b$ 's exports in the total imports of the SG-imposed country, Turkey in our case. To the extent that the country imposing the SG duties depends heavily on the market of country  $b$  as an outlet for its own exports, the higher the import share that the protected market is willing to allow. Thus, the expected sign is positive ( $\alpha_5 > 0$ ).

The predictor variable  $X_{a,b;t_0+1}$  represents the share of exports of country  $b$  in the product  $a$ , in world markets. This variable is introduced to capture the comparative advantages of country  $b$  as the supplier of the product  $a$ . The expected sign of the variable is positive ( $\alpha_6 > 0$ ). To put it in another way, the greater the comparative advantages in the production of the good  $a$  by the exporting country  $b$ , the larger the capacity to penetrate the import market of SG imposing country. The variable  $Z_{a,b;t_0+1}$  captures the comparative advantages of the total export basket<sup>12</sup> of the exporting country  $b$ . We expect the sign of the relationship to be positive ( $\alpha_7 > 0$ ).

#### 4.2. Justification of variables (and expected signs) in Equation 3.2

The effect of variable  $\bar{M}_{a,b}$  on the dependent variable  $\Delta M_{a,b;t_0+1}$  is expected to be null ( $\beta_1 = 0$ ) when  $\tau_k = \text{quota}$ , as the market shares for  $t_0+1$  are expected to reflect historical averages. Despite this, when  $\tau_k \in \{\text{TRQ}, \text{tariff}\}$  the expected sign of the relationship is ambiguous, a positive sign ( $\beta_{2k} > 0, k = 1, 2$ ) would indicate that SG favours large suppliers at the expense of small ones, while a negative

sign would seem to suggest a result favoring small suppliers.

Concerning the explanatory variable  $\Delta M_{a,b;t_0-1}$ , if SG is a quota, a negative impact on the dependent would be expected as Article 5.2(b) of the AoS<sup>13</sup> allows the country imposing the SG action to discriminate against exports that have experienced a recent "disproportionate" percentage increase. In the case where  $\tau_k = \text{tariff}$  the sign of the relationship is unclear, a positive impact of historical growth in the share of imports after the SG would suggest that tariffs favor new entrants at the expense of established suppliers, while a negative result would mean a favorable outcome for established suppliers that might have suffered a loss of market share in the three years prior to the implementation of the SG measure.

The explanatory variable  $Rb$  denotes the retaliation capacity of the exporting country  $b$ . For instance, the dependent variable  $\Delta M_{a,b;t_0+1}$  in equation (3.2) is expected to be positively impacted by higher retaliation capacity.

A new explanatory variable  $Eb$  is introduced in equation 3.2, as this dummy variable establishes whether exporting country  $b$  has been exempted from the SG duties by Turkey. Exporters exempted from the SG duties are prospected to benefit from a rise in market share following the SG is applied. With the object of controlling the effect of such exemptions, the variable dummy  $Eb$  takes the value "1" if the exporting country was exempted from the SG by the imposing country and "0" in another case. This variable is introduced in interaction with variable  $I_{PTA}$  (i.e.,  $I_{PTA}Eb$ ) which takes the value "1" when the exporting country is a member of the preferential trade agreement (PTA) with Turkey and "0" in another case.<sup>14</sup> This interaction variable is included to see whether there is a differential effect on the results experienced by exempted countries that are members of the PTA versus exporters that are exempted because they are rather a small supplier which is a developing country.<sup>15</sup>

The predictor variable  $X_{a,b;t_0+1}$  demonstrates the share of country  $b$ 's exports in world markets, with respect to product  $a$ . We would expect a positive relationship between the dependent variable and the variable  $\Delta X_{a,b;t_0+1}$ , meaning that if country  $b$  enjoys a change in the comparative advantage that gives it a larger share in the import market of the product at the world level, then country  $b$ 's share in the import market of the country applying the SG action should also rise. Besides, the variable  $Z_{a,b;t_0+1}$  is included in the equation, which captures the comparative advantages of the total export basket<sup>16</sup> of the exporting country  $b$ . The sign of the relationship should be positive ( $\beta_9 > 0$ ).

## 5. Empirical findings

### 5.1. Results of the estimated equations

The results<sup>17</sup> of the estimation of equation (3.1) are presented in Table 3. Column (1) is the baseline specification with the

<sup>13</sup> Article 5.2 (a) of the AoS indicates that: "(...) the Member concerned shall allot to Members having a substantial interest in supplying the product shares based upon the proportions, supplied by such Members during a previous representative period, of the total quantity or value of imports of the product, due account being taken of any special factors which may have affected or may be affecting the trade in the product." This provision can be considered as one of the discriminatory sides of the safeguards.

<sup>14</sup> For the list of countries which have PTA with Turkey, please see below link: <https://www.ticaret.gov.tr/dis-iliskiler/serbest-ticaret-anlasmalari/genel>.

<sup>15</sup> Please see original WTO notifications by Turkey for checking the list the countries which are exempted from particular Turkish SG duties. The list can also be obtained from the author upon request.

<sup>16</sup> This variable is included in the analysis; and does not belong to the original formulation of Bown and McCulloch (2004).

<sup>17</sup> The calculation formulas, which show how variables estimated in equations (3.1) and (3.2) are constructed, can be found at Appendix A.

<sup>6</sup> The definition of the product groups corresponds to that in Table 1.

<sup>10</sup> Some ambiguities emerge in the literature regarding how TRQ actions are administered as SG policies. We see the quotas are sometimes considered as TRQs or vice versa, particularly when the distinction is not very clear.

<sup>11</sup> Parameter  $\alpha_1$  should capture the differential effect when the SG action is applied by means of an import quota.

<sup>12</sup> This variable is introduced by the author and does not belong to the original formulation of Bown and McCulloch (2004), which differentiates our study from Bown and McCulloch (2004), and can be considered as an extension.

**Table 3**  
Estimation results for Equation 3.1.

Dependent Variable: Exporter's share of the SG-imposing country's (Turkey's) 4 and 6 digit HS import market in t+1				
Explanatory Variables	Baseline Specification (1)	Add Product Dummies (2)	Add Exporter Dummies (3)	Volume Share (4)
Intercept	−0.0007 [0.934]	−0.0007 [0.933]	0.0035 [0.904]	−0.0345 [0.447]
Exporter's historical share over t-3, t-2 and t-1 ( $\bar{M}_{a,b}$ )	0.559*** [0.00]	0.561*** [0.00]	0.586*** [0.00]	0.690*** [0.00]
x (i.e., interacted with) SG policy was a tariff ( $\tau_1 \bar{M}_{a,b}$ ); $\tau_1 = \text{tariff}$	0.224** [0.013]	0.233** [0.010]	0.203** [0.029]	−1.325** [0.033]
x (i.e., interacted with) SG policy was a TRQ ( $\tau_2 \bar{M}_{a,b}$ ); $\tau_2 = \text{TRQ}$	0.394*** [0.00006]	0.398*** [0.0005]	0.380*** [0.0013]	−1.130*** [0.00]
Percent change in exporter's share between t-3 and t-1 ( $\Delta M_{a,b; t_0-1}$ )	−0.312* [0.057]	−0.302* [0.067]	−0.284* [0.092]	0.499*** [0.00]
x (i.e., interacted with) SG policy was a tariff ( $\tau_1 \Delta M_{a,b; t_0-1}$ ); $\tau_1 = \text{tariff}$ )	0.408** [0.012]	0.382** [0.020]	0.363** [0.032]	−0.381*** [0.00]
x (i.e., interacted with) SG policy was a TRQ ( $\tau_2 \Delta M_{a,b; t_0-1}$ ); $\tau_2 = \text{TRQ}$ )	2.403*** [0.00]	2.386*** [0.00]	2.371*** [0.00]	−0.212 [0.189]
Share of SG-imposing country's exports sent to affected exporting country ( $X_{a,b; t_0+1}$ )	0.265*** [0.00]	0.266*** [0.00]	0.253*** [0.00]	0.851*** [0.00]
$R_b$	0.020 [0.621]	0.014 [0.726]	−0.404 [0.985]	0.654 [0.984]
$Z_{a,b; t_0+1}$	0.067 [0.137]	0.073 [0.108]	0.015 [0.985]	0.206 [0.876]
SG case dummy variables	Yes	No	No	No
Product dummy variables	No	Yes	Yes	Yes
Exporting country dummy variables	No	No	Yes	Yes
Number of observations	2572	2572	2572	2572
Adjusted R <sup>2</sup>	0.838	0.837	0.835	0.649

Note: P-values are in brackets; with \*\*\*, \*\* and \* denoting variables statistically different from zero at the 1, 5 and 10 percent levels, respectively. Time  $t_0$  is the year of the application of the SG.

Source: Author's calculations.

determinants of the share of exports (from the countries in the sample) in the import market of Turkey, country that imposes SG in year  $t_0$ ; additionally the formulation includes the SG case dummy variables. The explanatory variable  $\bar{M}_{a,b}$ , which approximates the historical market share of country  $b$ 's exports in Turkey's imports for the three years prior to the imposition of the SG, enters specification (1) both independently and in interaction (i.e., ( $\tau_1 \bar{M}_{a,b}$ ),  $\tau_1 = \text{tariff}$  y ( $\tau_2 \bar{M}_{a,b}$ ),  $\tau_2 = \text{TRQ}$ ). It can be observed that the participation of the historical trend is strongly significant both independently and in interaction with the tariff and TRQ measures, it also has the expected positive sign and the result is robust across all specifications. It should be noted that the impact of SG applications in the form of quotas is greater than through TRQ and this in turn is greater than the impact based on tariffs, and this result is significant to all specifications.

The predictor variable  $\Delta M_{a,b; t_0-1}$  which approximates the market gain or loss of the exporting country in the period prior to the implementation of SG by Turkey is weakly significant (at the level of 10%) in specifications (1)–(2)–(3) and the negative sign is not the expected as if Turkey imposed SG measures on the countries in the sample it is because those countries were incurring a disproportionate penetration of the Turkish importing market, however, the variables of interaction (i.e., ( $\tau_1 \Delta M_{a,b; t_0-1}$ );  $\tau_1 = \text{tariff}$ ) y ( $\tau_2 \Delta M_{a,b; t_0-1}$ );  $\tau_2 = \text{TRQ}$ ) show that through safeguard policies (tariff and TRQ) the variable  $\Delta M_{a,b; t_0-1}$  significantly and positively impacts the export share of exporting countries in the  $t_0+1$  period. On the other hand, this pattern is robust across all specifications. Note that in magnitude the impact of SG measures applied by Turkey to influence the participation of exporters channeled through the variable  $\Delta M_{a,b; t_0-1}$  is greater through TRQ, and in turn the impact on the form of tariffs is greater than through

quotas, this result being significant to all specifications.

Of the control variables  $R_b$  and  $Z_{a,b; t_0+1}$  only that which approximates the comparative advantage of the exporting country ( $X_{a,b; t_0+1}$ ) was significant and with the expected sign across all specifications.

The results of equation (3.1) show that Turkey's use of SG measures as a policy instrument to protect its domestic industry effectively had a discriminatory impact on the countries in the sample, regardless of whether the SG was a quota, tariff or TRQ. On the other hand, the robustness of the results obtained with formulations (1), (2) and (3) was validated by specification (4), in which, although the dependent and explanatory variable was measured in terms of trade volume, a pattern similar to that of the first three formulations was observed.

Table 4 shows the results of the estimation of equation (3.2) which has specifications similar to those of Table 1.3, however, now introduces the variable dummy  $E_b$  that establishes whether the exporting country  $b$  has been exempted from the SG measure by Turkey, and the interaction variable  $I_{PTA}E_b$ , where the variable  $I_{PTA}$  that takes the value one if the exporting country is subscribed to the preferential trade agreement with Turkey and '0' in another case. In this equation, we concentrate on  $\Delta M_{a,b; t_0+1}$  rather than  $M_{a,b; t_0+1}$ .

Specification (5) is the base reference, variable  $\bar{M}_{a,b}$  which measures the historical average share and allows to capture the differential effect when SG action is implemented through a quota is not significant<sup>18</sup> as suggested above. On the other hand, when the SG action introduced by Turkey is in the form of a TRQ the impact of the historical average is significant and positive, suggesting that

<sup>18</sup> At the significance levels of 1% and 5%.

**Table 4**  
Estimation results for Equation 3.2

Dependent Variable: Percent change in exporter's share of the SG-imposing country's (Turkey's) 4 and 6 digit HS import market between t-1 and t+1				
Explanatory Variables	Baseline Specification (5)	Add Product Dummies (6)	Add Exporter Dummies (7)	Volume Share (8)
Intercept	−0.0065 [0.546]	−0.0064 [0.552]	0.0151 [0.684]	−0.0654 [0.142]
Exporter's historical share over $t-3$ , $t-2$ and $t-1$ $\bar{M}_{a,b}$	−0.191 [0.084]	−0.188 [0.092]	−0.147 [0.205]	−0.082 [0.264]
$x$ (i.e., interacted with) SG policy was a tariff ( $\tau_1 \bar{M}_{a,b}$ ); $\tau_1 = \text{tariff}$	0.073 [0.512]	0.077 [0.492]	0.026 [0.818]	−0.013 [0.982]
$x$ (i.e., interacted with) SG policy was a TRQ ( $\tau_2 \bar{M}_{a,b}$ ); $\tau_2 = \text{TRQ}$	0.555*** [0.0001]	0.567*** [0.00]	0.520*** [0.00047]	−1.885*** [0.00]
Percent change in exporter's share between $t-3$ and $t-1$ ( $\Delta M_{a,b; t_0-1}$ )	−0.631*** [0.0018]	−0.614*** [0.0026]	−0.593*** [0.005]	0.108 [0.169]
$x$ (i.e., interacted with) SG policy was a tariff ( $\tau_1 \Delta M_{a,b; t_0-1}$ ); $\tau_1 = \text{tariff}$	0.340* [0.093]	0.311 [0.128]	0.289 [0.173]	−0.421*** [0.00]
$x$ (i.e., interacted with) SG policy was a TRQ ( $\tau_2 \Delta M_{a,b; t_0-1}$ ); $\tau_2 = \text{TRQ}$	3.482*** [0.00]	3.447*** [0.00]	3.396*** [0.00]	0.429*** [0.0071]
Dummy if the exporting country was formally exempted $E_b$	0.0006 [0.809]	0.0012 [0.632]	0.013** [0.012]	0.020*** [0.0012]
$x$ (i.e., interacted with) exporter is not a PTA member $I_{PTA} E_b$	0.006 [0.236]	0.0057 [0.270]	−0.011 [0.359]	−0.019 [0.195]
$\Delta X_{a,b; t+1}$	−0.0008 [0.620]	−0.0014 [0.423]	−0.002 [0.297]	−0.0017 [0.477]
$R_b$	0.144** [0.019]	0.138** [0.025]	4.908 [0.781]	8.549 [0.698]
$Z_{a,b; t_0+1}$	−0.0054 [0.928]	−0.0105 [0.861]	−1.217** [0.023]	−1.688*** [0.0093]
SG case dummy variables	Yes	No	No	No
Product dummy variables	No	Yes	Yes	Yes
Exporting country dummy variables	No	No	Yes	Yes
Number of observations	2572	2572	2572	2572
Adjusted $R^2$	0.293	0.2904	0.2687	0.158

Note: P-values are in brackets; with \*\*\*, \*\* and \* denoting variables statistically different from zero at the 1, 5 and 10 percent levels, respectively. Time  $t_0$  is the year of the application of the SG.

Source: Author's calculations.

TRQ does not favor new suppliers entering the Turkish import market at the expense of already established suppliers. The impact through tariffs was not significant.

In relation to the variable  $\Delta M_{a,b; t_0-1}$ , it is strongly significant and with the expected negative sign, which indicates that Turkey applied SG measures in the form of quotas to discriminate against exports that experienced disproportionate percentage increases in the recent past. On the other hand, in cases where the SG action was applied in the form of TRQ ( $\tau_2 \Delta M_{a,b; t_0-1}$ ;  $\tau_2 = \text{TRQ}$ ) the impact of  $\Delta M_{a,b; t_0-1}$  was positive and significant which proves that the measure does not favor new suppliers entering the Turkish import market at the expense of established providers. For its part, when the SG policy was implemented through tariffs the impact was not significant.

As for the dummy variable  $E_b$ , which measures whether exporting country  $b$  has been exempted from SG actions by Turkey, this is significant both in the specification (7) which adds dummy variables per exporting country and in the specification (8) which assesses the robustness of the results, indicating that the exception allows for increased market share. In addition, the interaction variable ( $I_{PTA} E_b$ ) gives an interesting result, given that it is not significant across all formulations, therefore suggesting that there is no evidence that among the countries exempted from SG actions by Turkey there are differential effects for being a participant in a PTA with Turkey.

In relation to the control variables only the variable that measures retaliation capacity by exporters was significant and with the expected positive sign. Thus indicating that to the extent that the country imposing SG measures depends heavily on the market of country  $b$  as an outlet for its own exports the higher was the increase in the import share that the Turkish market was willing to grant.

Unlike the results obtained with equation (3.1), the estimate of

equation (3.2) shows that Turkey's use of SG duties as a policy instrument to protect its domestic industry was most effective when the SG measure took the form of a quota or a TRQ. Alternatively, the robustness of the results obtained with formulations (1), (2) and (3) was validated by specification (4), in which, although the dependent and explanatory variable was measured in terms of trade volume, a pattern relatively similar to that of the first three formulations was observed.

## 6. Conclusion

This study focuses on analyzing the impacts Turkey's 16 SG measures between 2003 and 2013. Following are the main findings of the research: (i) SG measures showed a discriminatory impact on imports from the main trading partners, and (ii) quotas and TRQs were more effective than tariffs in restricting imports.

We also found when SG is a TRQ, growth rate of historical market share tends to be strongly preserved. This means that, as compared to the existing suppliers, the duty does not favor new suppliers joining the Turkish import market. Regardless of how the dependent variable is evaluated, the results remain the same (share of exports within Turkish imports or their growth rate). It's worth remembering that if the dependent variable is market gain or loss, the historical market share growth rate is maintained when the SG is in the form of tariff, but not when the dependent variable is the share of exports within Turkish imports.

The empirical study did not provide evidence of differential effects among the countries, which are exempted from SG actions by Turkey due to their involvement in a preferential trade agreement with Turkey. This is an important final result as well. The



significance of the effect of being exempted from the application of SG measures by Turkey was not robust to all specifications.

As per the policy implications, Turkey has made a more systematic than eventual use of SG applications to restrict imports during the study period. Some of Turkey's SG activities seem to have lasted longer than anticipated, causing possible anomalies in the markets covered by SGs. This could be interpreted as evidence that long-term trade protectionism as a trade policy might sometimes result in inefficient resource transfers.

We are of view that, future research might focus on doing a similar analysis for Turkey's SG actions using a broader time span, when Turkey uses all types of SGs. One major limitation of our research might be the strong focus on the Turkish case only. Similar research methodology can be applied to SG applications by other developing countries like Indonesia, India, Egypt and Morocco, so that the results can be compared.

### Declaration of competing interest

I declare that I have no conflict of interest.

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### Appendix A

This appendix demonstrates the calculations used for selected variables in Equations (3.1) and (3.2):

#### A.1. Historical Market Share

$\overline{M}_{a,b}$  is the average market share of the exporting country  $b$  in Turkey (importing market) during three years prior to the application of SG measures:

$$\overline{M}_{a,b} = \frac{M_{a,b;t_0-1} + M_{a,b;t_0-2} + M_{a,b;t_0-3}}{3}$$

#### A.2. Market Gain or Loss

$\Delta M_{a,b;t_0-1}$  shows the percentage change in the share of country  $b$ 's exports in total Turkish imports of the product  $a$ , between years  $(t_0 - 1)$  and  $(t_0 - 3)$ :

$$\Delta M_{a,b;t_0-1} = \frac{M_{a,b;t_0-1} - M_{a,b;t_0-3}}{0.5(M_{a,b;t_0-1} + M_{a,b;t_0-3})}$$

#### A.3. Percentage Change of Import Share

$\Delta M_{a,b;t_0+1}$  shows the percentage change in the share of country  $b$ 's exports in total Turkish imports of the product  $a$ , between years  $(t_0 + 1)$  and  $(t_0 - 1)$ :

$$\Delta M_{a,b;t_0+1} = \frac{M_{a,b;t_0+1} - M_{a,b;t_0-1}}{0.5(M_{a,b;t_0+1} + M_{a,b;t_0-1})}$$

### Appendix B

This appendix depicts the SG types with relevant HS Codes:

Quotas	7004, 7005
<b>Tariff Rate Quotas (TRQ)</b>	8504.31, 9030.39, 3802.90
<b>Tariffs (Additional Duties)</b>	3605, 4202, 4202.11, 4202.12, 4202.19, 4202.21, 4202.22, 4202.29, 4202.31, 4202.32, 4202.39, 4202.91, 4202.92, 4202.99, 5205, 5205.12, 5205.22, 5205.32, 5205.42, 6402, 6403, 6404, 6402.99, 6403.51, 6403.59, 6403.91, 6403.99, 6404.19, 6404.20, 9003, 9003.11, 9003.19, 2501.00, 2917.36, 3907.60, 8508.11, 8509.40, 8509.80, 8516.31, 8516.60, 8516.72, 8516.79, 8509.10, 8516.40, 8711.10, 8711.20, 8711.30.

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