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Can Bangladesh absorb LDC graduation-induced tariff hikes?

Evidence using product-specific price elasticities of demand and markups for apparel exports to Europe

Mohammad Abdur Razzaque
Deen Islam
Jillur Rahman

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Can Bangladesh Absorb LDC Graduation-induced Tariff Hikes? Evidence Using Product-specific Price Elasticities of Demand and Markups for Apparel Exports to Europe

Mohammad Abdur Razzaque, Deen Islam, Jillur Rahman

I. Introduction

Over the past several decades, the readymade garment industry has been the main driver of Bangladesh's export growth, portraying the country as an export success story among the least developed countries (LDCs).[1] The erstwhile global trade regime greatly helped Bangladesh break into apparel markets, as the Multi-Fibre Arrangement (MFA) quotas—that governed the world trade in textiles and garments between 1974 and 2004—administering quantitative restrictions to control imports of textile and clothing items from developing countries, facilitated the relocation of a part of the production in Bangladesh from quota-constrained East Asian countries.[2] Another distinguishing feature of apparel markets in developed countries has been the prevalence of high Most Favored Nation (MFN) tariffs. Although quotas have been eliminated, tariffs persist as a trade policy instrument, often employed to provide trade preferences to developing countries through mechanisms like the Generalized System of Preferences (GSP).[3] While the average tariff on industrial goods in Western developed countries is in the range 2—3 percent, the corresponding rate for apparel, for instance in the European Union (EU) and United Kingdom (UK), is approximately 12 percent.[4] The EU GSP scheme, especially with the introduction of the so-called Everything But Arms (EBA) initiative for LDCs in 2001, allowed duty-free imports from LDCs under liberal rules of origin (RoO) requirements.[5]

[1] According to the United Nations (UN, 1971), the least developed countries (LDCs) are low-income countries with severe structural impediments to sustainable development. They are highly vulnerable to economic and environmental shocks and have low levels of human assets. Countries in the LDC group are determined by UN assessments. On the other hand, there are no specific definitions of 'developing' and 'developed' countries as used by the World Trade Organization (WTO). WTO members self-identify themselves as either developing or developed, and they recognize the UN-denominated LDCs as a special group of countries within the developing country category. There are provisions within the WTO system to grant special trade preferences and other support measures targeting the LDCs.

[2] The MFA evolved through four successive phases: MFA-I (1974-77), MFA-II (1978-81), MFA-III (1982-86) and MFA-IV (1986-94) before being incorporated into the World Trade Organization Agreement on Textile and Clothing (ATC). Under ATC, all quotas were liberalized in phases during 1995-2004.

[3] The Enabling Clause of the WTO acts a legal basis for the GSP systems that have allowed developed countries offering non-reciprocal preferential treatment (such as zero and low duties on imports) to products originating in developing countries. Under usual practices, LDCs are offered the most generous trade preferences, usually duty-free market access in a wide range of products. GSP regimes and the associated benefits for recipient countries differ among developed countries.

[4] The comparable average tariffs in Canada and the United States are 17 and 16 percent, respectively.

[5] The Rules of Origin (RoO) specify the required local content in export items from an exporting LDC to prevent trade deflections. Trade deflections occur when a beneficiary country imports the entire product from a third country and then exports it, aiming to take advantage of duty-free market access. The RoO ensures that only goods with sufficient local production or value addition are eligible for such preferential access. The EU initially required a three-stage

Taking advantage of EBA preferences, Bangladesh's apparel exports to the EU soared from $2 billion in 2001 to about $23 billion in 2023. The UK, as part of the EU until recently and later, post-Brexit, offering a similar LDC trade scheme, witnessed a rise in Bangladesh's apparel exports from about $500 million to $5 billion over the same period. The EU and UK together comprise just about 60 percent of Bangladesh's garment exports.[6] And more than 90 percent of Bangladesh's Europe-bound exports are in clothing items. On the domestic front, various policy support such as allowing imports of raw materials and intermediate inputs through back-to-back letters of credit, bonded warehouses to import duty-free intermediate inputs, and generous export subsidies, created a favorable ecosystem for the RMG industry to thrive. Furthermore, owing to the labor-intensive nature of apparel production, Bangladesh's inherent advantage lies in its abundant supply of affordable and easily trainable labor.

Bangladesh's export-oriented apparel industry now stands at a critical juncture as the country is set to graduate from the LDC group in 2026.[7] Graduation could imply forgoing the trade preferences granted by the EU (and other countries). Consequently, the current duty-free market access in the EU could be replaced by an average tariff of about 12 percent for Bangladesh. Given that over 70 per cent of all exports with LDC-related trade preferences for Bangladesh originate from European markets (Razzaque et al. 2022), it is important to understand how LDC graduation can impact the country's competitiveness in these markets. Textbook cases typically indicate that that an increase in tariff rates on a country's exports can reduce the net prices received by exporters, thereby negatively impacting export performance.

Various studies indicate that the rise in tariffs after LDC graduation will result in a significant shock to Bangladesh's exports (WTO and EIF, 2020; UNCDP, 2019; Razzaque et al., 2020; Rahman and Bari (2018), Rahman et al., 2020; Takashi & Noriyushi, 2021). Using a computable general equilibrium modelling framework and comparing the current tariff structures faced by LDCs with a post-graduation counterfactual scenario, the United Nations Conference on Trade and Development (UNCTAD) estimated a potential export loss of 5.5–7.5 per cent for Bangladesh (UNCTAD, 2016). Employing a partial equilibrium

transformation for woven garments (i.e., an eligible LDC should produce yarn from cotton, then make fabrics using the domestically produced yarn and then finally cut and make fabrics to produce garments) and a double stage transformation for knitwear (from cotton to locally produced yarn from which item to be knitted). Under the EU's Everything But Arms (EBA) initiative in 2001, the rules of origin requirements for LDCs in woven garments were derogated to double transformation only, allowing yarn to be imported for fabric making). In 2011, the EU relaxed its RoO for LDCs further allowing single-stage transformation for both knitwear and women garments.

[6] Among other countries that provide duty-free access due to LDC status and are significant importers (e.g., over $1 billion annually) of clothing items made in Bangladesh include Australia, Canada, India, and Japan. In contrast, the United States, which imported nearly $9 billion worth of apparel from Bangladesh in 2023, stands out as an exception among developed nations. It has never extended trade preferences specifically for Bangladeshi-manufactured garment items.

[7] LDC graduation requires a country meet at least two of three pre-defined development threshold criteria in two consecutive ECOSOC Committee for Policy Development (UNCDP) triennial reviews. The three thresholds are determined by per capita gross national income (GNI), Human Asset Indicators (HAI), and in Environmental Vulnerability Index (EVI). For example, in 2021, the thresholds were $1,222 per capita GNI, 66 or above HAI, and 32 and below EVI. Bangladesh met the graduation criteria for the first time in 2018 triennial review and again in the 2021 review, and eventually has been scheduled for graduation in November 2026.

model, an ex-ante analysis undertaken in WTO (2020) suggest a decline of more than 14 per cent in Bangladesh's exports due to tariff increases in various destination countries following graduation.

The extent of export shock resulting from tariff rises depends on the price responsiveness of export demand. Although studies do regularly highlight the potential impact of tariff preference erosion on export competitiveness, the fundamental issues of the price elasticity of demand for and markups associated with Bangladesh's garment exports remain unaddressed. Instead, partial equilibrium and general equilibrium simulation exercises employ ad hoc elasticity values to demonstrate the potential impact. There is also no consensus on the elasticity value that one should use. Earlier studies on Bangladesh (e.g., Ahmed et al. 1993, Bayes et al. 1995, Hossain 1995, Hossain et al. 1997, and Shilpi 1990) using time series data to estimate typical export demand equations found quite small price elasticities, often less than one absolutely, implying that exports are highly price inelastic. This seems counterintuitive, especially for clothing items, as there are many close substitutes. On the other hand, Panagariya, Shah, and Mishra (2001) using a novel theoretical framework and complemented by a suitable econometric methodology for disaggregated export data found very high elasticity values—around 26—that would eventually indicate Bangladesh to behave like a 'small country' in international trade. Things have changed significantly since the Panagariya, Shah, and Mishra (2001) study was undertaken, using the data for the late 1990s, as at that time Bangladesh has a small export market share. Bangladesh's export market share in the EU and UK has increased from less than 2 per cent in the late 1990s to more than 20 percent in 2022. Therefore, one issue is if such large elasticity estimates reported by Panagariya, Shah, and Mishra would be compatible under the garment trade in Europe.

Recent global studies have started to report larger elasticities than those obtained in the traditional literature (of around 1). Some of these studies use the gravity moelling framework (e.g., Eaton and Kortum's (2002) while others have used firm-level data (Fontagne, Martin, & Orefice, 2018). Data limitations and a lack of suitable empirical framework for recovering elasticity parameters associated with Bangladesh means, it is often not possible to employ these methodologies.

In the above backdrop, this study employs a more suitable analytical framework grounded in microeconomic theory to unravel the nuanced dynamics of the demand for apparel products. This granular approach allows for a deeper exploration of clothing exports considering individual importing counties within the EU along with the suppliers such as Bangladesh and its rivals. Utilizing highly detailed EU import data for apparel products, this study estimates the parameters of the demand system including own price and cross-price elasticities. The elasticity estimates allow uncovering the extent of markups enjoyed by Bangladeshi garment exporters, providing a profound understanding of their ability to navigate price shocks stemming from potential tariff revisions due to LDC graduation.

This study makes two important contributions. First and foremost, considering the evolving literature at the forefront of existing knowledge on trade elasticities, it offers a simple estimation framework to consistently and efficiently estimate the own- and cross-price elasticities using highly granulated and publicly available apparel trade data. This approach delves into the intricacies of clothing exports, revealing insights that remain hidden in aggregated data. The estimates of own-price elasticities appear

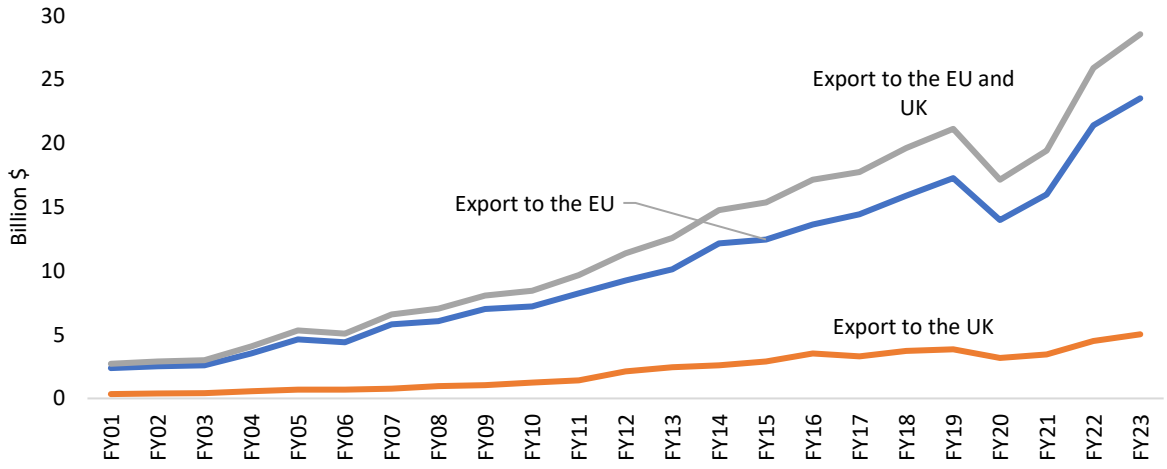
to be compatible with the characteristics of apparel trade and are very similar to recent studies that use firm-level data (e.g., Fontagne, Martin, & Orefice, 2018). And, secondly, the results of this paper have important policy implications related to export competitiveness of Bangladesh, which is set to come to terms with unprecedented global trade regime shifts along with its LDC graduation.

The rest of the paper is structured as follows. The current state of Bangladesh's apparel exports and potential post-graduation tariff schemes in the EU and the UK are discussed in section II. Methodology and estimation framework, along with data description, are provided in section III. Results on the estimate of the elasticity of export volumes to (instrumented) export prices and estimates of markup are discussed in section IV. Section V provides discussions on the findings and policy implications. The last section concludes and attempts to provide an interpretation of our results, in particular relating to the ability to absorb the price shocks by Bangladesh's garment exports following the LDC graduation.

II. Bangladesh's Apparel Exports to Europe

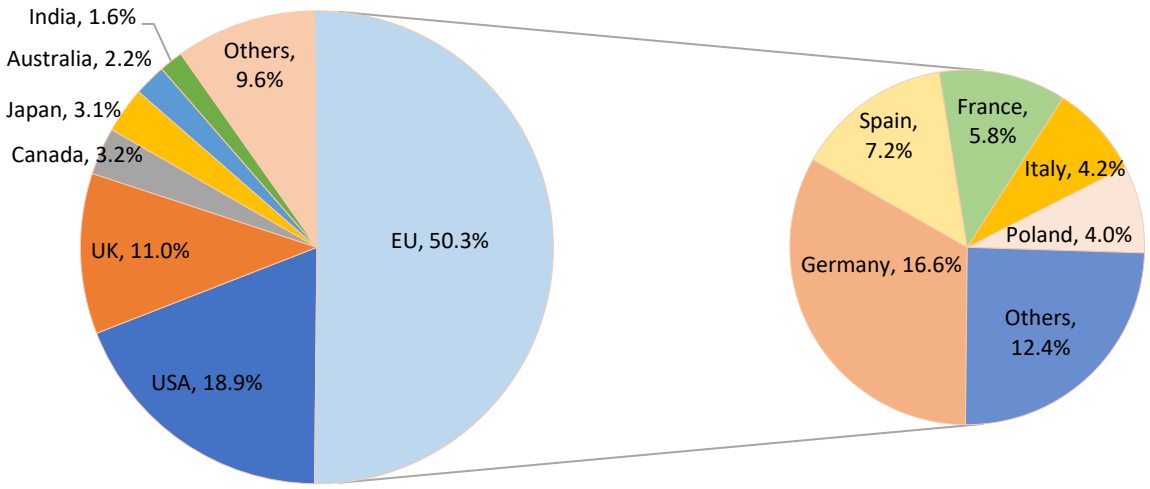
The European Union (EU) and the United Kingdom (UK), henceforth referred to as Europe, are extremely important export destinations of Bangladesh. In the fiscal year 2022-23, Europ-bound merchandise exports from Bangladesh amounted to $30.5 billion, of which apparel exports comprised $28.6 billion, representing a remarakable expansion from less than $3 billion in 2000-01 (Figure 1). The EU accounts for just above half of Bangladesh's garment exports while and the UK accounts for another 11 per cent (Figure 2). Apparel products dominate Bangladesh's total exports to Europe, constituting more than 93 per cent of the total export value (Figure 3).

Figure 1: Bangladesh's apparel export to the EU and the UK (billion $)



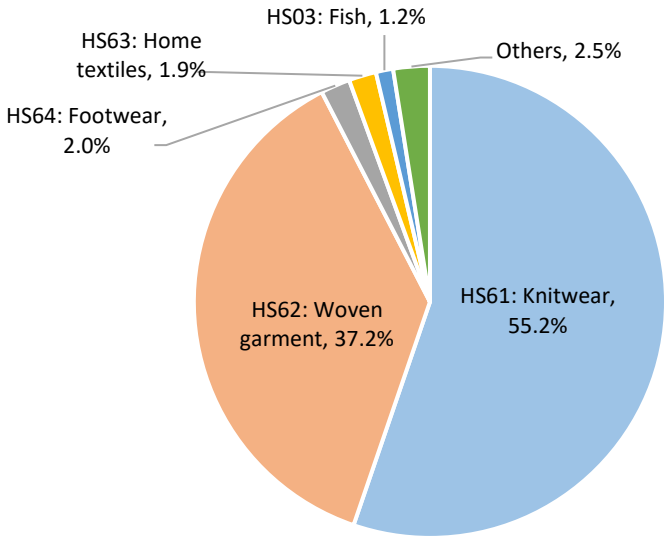
Source: Authors' presentation using Export Promotion Bureau (EPB) data

Figure 2: Partner country's share in Bangladesh's apparel exports, FY19-FY23



Source: Authors' presentation using Export Promotion Bureau (EPB) data

Figure 3: Composition of Bangladesh's exports to the EU and UK, FY19-FY23

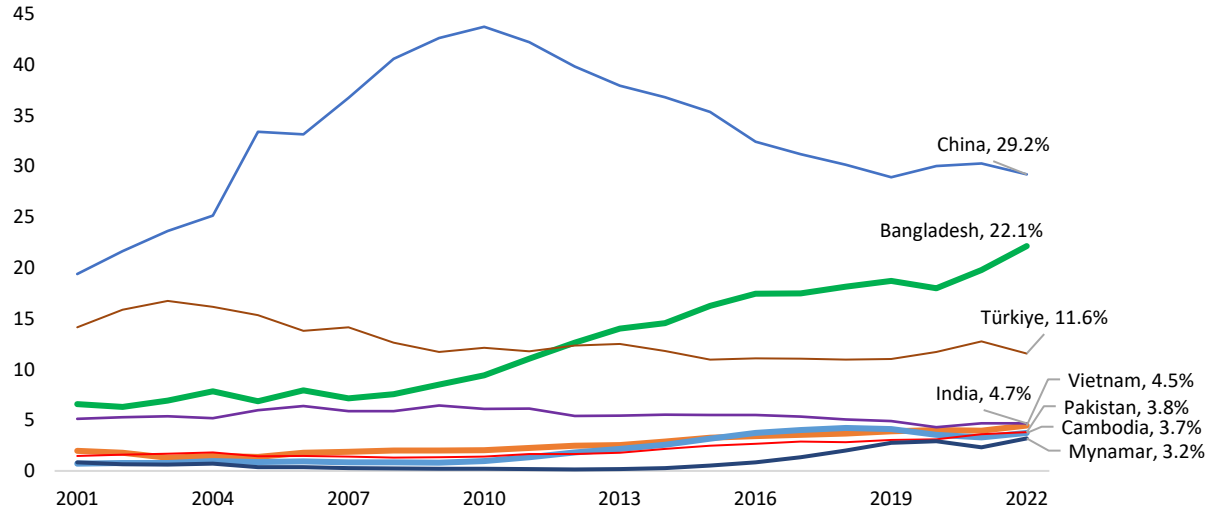


Source: Authors' presentation using Export Promotion Bureau (EPB) data

Over the past decade, Bangladesh has emerged as the second-largest source of apparel items for the EU. From 2010 to 2022, the Chinese share in apparel imports in the EU from non-EU countries (extra-EU) fell from 43.7 per cent in 2010 to 29.2 per cent in 2022. Bangladesh has been able to captured the most of the declining Chinese market share, boosting its share from 9.4 per cent in 2010 to 22.1 per cent in 2022 (Figure 4). A similar trend has been observed in the UK market, where China's market share declined from 37 per cent in 2010 to about 25.5 per cent in 2022. During the same time, Bangladesh increased its market

share from 7.1 per cent to 18.8 per cent. Bangladesh's major comparators, Vietnam, India, Cambodia, and Pakistan, experienced minimal growth in their respective market shares. The apparel export growth of Bangladesh in the EU and UK markets can be attributed to the duty-free access provided to Bangladesh as the Least Developed Country (LDC), which helped Bangladesh become more competitive in these markets. Bangladesh also benefitted from the relaxed rules of provision to get duty-free access. More specifically, a robust export performance has been greatly aided by the EU's derogation of rules of origin requirement in 2011 for LDC's clothing suppliers. Until 2011, EU rules of origin required a 'double transformation' of clothing items as a precondition for tariff-free market access.[8] The derogation allowed a single transformation for LDC's clothing exports, which generated a reinvigorated apparel supply from Bangladesh, raising its share in exports.

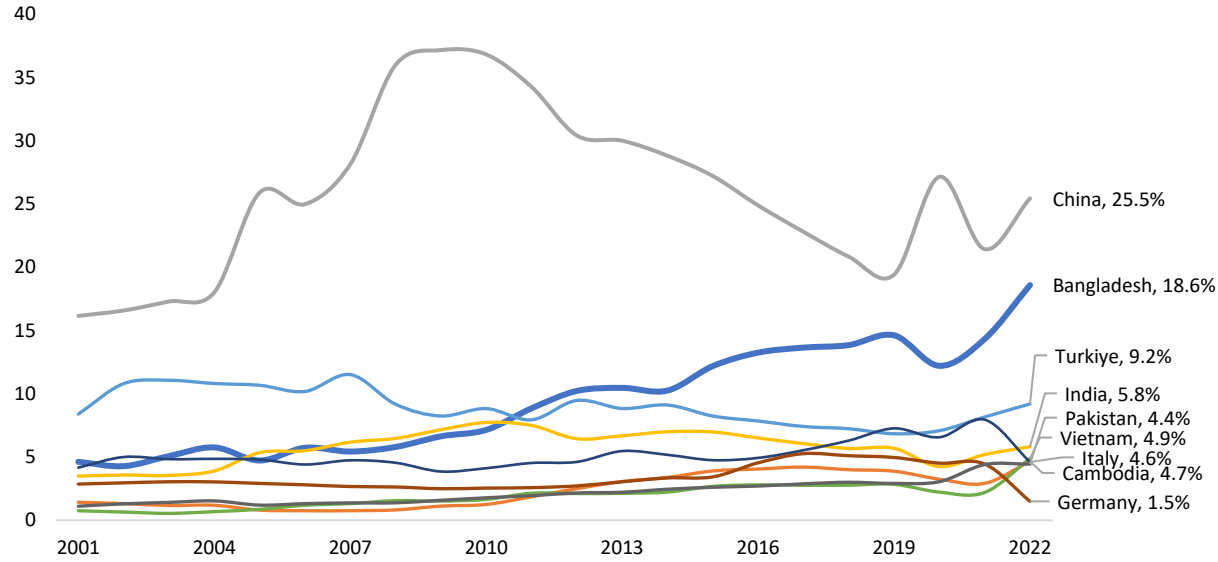
Figure 4: Share of selected countries in extra-EU apparel imports (%)



Source: Authors' presentation using EU ComEXT data.

[8] Double-stage transformation criteria means apparel exporters must use domestically produced fabric to produce clothing (e.g. from yarn to fabric and from fabric to garment). Single stage transformation allows apparel exporters to use imported fabric to produce clothing (e.g., from fabric to clothing).

Figure 5: Apparel market shares of selected countries in the UK (%)



Source: Authors' presentation using International Trade Centre (ITC) data.

Bangladesh's share in individual European Union (EU) countries' apparel imports varies across the member states. Figure 6 represents the trend of Bangladesh's market share in individual EU country's apparel imports from non-EU countries. The figure shows that Bangladesh has a substantial market share in most EU countries' apparel imports. Bangladesh's market shares in five major EU apparel importers, namely Germany, France, Spain, Italy, and the Netherlands, reached at 24.7 per cent, 20.1 per cent, 23.1 per cent, 19.4 per cent, and 18.5 per cent, respectively, in 2022 (Figure A1). Among others, Bangladesh captures more than 30 per cent of apparel market share in Slovenia and Poland, 21-30 per cent shares in Cyprus, Slovenia, Denmark, Czechia, Sweden, Austria, and Portugal, 11-20 per cent in Belgium, Ireland, and Hungary, 5-10 per cent in Greece, Finland, Romania, Croatia, and Malta, and less than 5 per cent shares in other EU countries (Figure A1).

Current and post-graduation tariff regimes in the EU and the UK

Bangladesh is set to graduate from the list of least developed countries (LDCs) in November 2026.[9] Both the EU and the UK allow three years' transition period from the LDC-specific preferential scheme for the graduating LDCs to ensure a smooth adjustment from duty-free market access. Therefore, Bangladesh will enjoy the current market access for its exports until November 2029 in the EU and the UK. Then, its preferential market access will be replaced by less favourable schemes according to the respective country's GSP scheme for developing countries.

[9] United Nations (2021). Graduation of Bangladesh, the Lao People's Democratic Republic and Nepal from the least developed country category. Resolution adopted by the General Assembly on 24 November 2021. United Nations General Assembly, New York.

Currently, as an LDC, Bangladesh enjoys duty-free access to the EU for all exports, except for arms and ammunition under the Everything But Arms (EBA) scheme. Under this scheme, Bangladesh's apparel products enjoy duty-free benefits in contrast to the approximately 11.8 per cent Most Favored Nation (MFN) duty imposed on non-LDCs. China, in contrast, lacks preferential treatment in the EU and is obligated to pay the standard MFN duty. Until 2020, Vietnam, another competitor, did not have duty-free treatment in the EU and UK, rather, they had tariff access under the Standard GSP. However, Vietnam has embarked on a free trade agreement (FTA) with the EU and UK. After enacting the EU-Vietnam Free Trade Agreement (FTA) in 2020, Vietnam witnessed a substantial tariff reduction for apparel exports, paying a 5 per cent tariff in 2022 and enjoying a 6.8 per cent margin of preferences.[10] Furthermore, Vietnam is set to eliminate tariffs on apparel product exports to the EU entirely by 2027. Meanwhile, India currently faces an average tariff of 9.5 per cent for these items under the Standard GSP, while Pakistan and Sri Lanka secure duty-free access for their apparel under the GSP+ scheme.

The EU's current GSP regime was set to expire in December 2023 and was supposed to be replaced with a new regime for 2024-2034, but its adoption has been deferred, which is expected to be enacted by 2027. After LDC graduation and three years transition period, Bangladesh may be entitled to Standard GSP or GSP+ depending on complying with certain criteria (Razzaque and Rahman, 2022). If Bangladesh gets GSP+ after graduation, apparel exports to the EU will retain the current duty-free market access and continue enjoying an 11.8 per cent margin of preference. On the other hand, if Bangladesh gets Standard GSP, apparel exports to the EU will have to face a 9.5 per cent tariff. However, if the proposed GSP regime for 2024-34 is adopted in its current format, clothing products from Bangladesh will not receive any tariff preferences due to safeguard measures (Razzaque and Rahman, 2022), resulting in an 11.8 per cent tariff hike against zero duty facilities under EBA and GSP+. This will cause a significant loss of competitiveness. Bangladesh's export competitiveness is poised to suffer additional setbacks as Vietnam's preferential tariffs are set to be eliminated to zero by 2027 as a result of the Free Trade Agreement (FTA). The loss of export competitiveness could have significant repercussions on Bangladesh's apparel export performance in the European Union (EU) market, potentially undermining its position and market share.

In the UK market, Bangladesh is enjoying duty-free access through Comprehensive Preferences (CP) under UK's Developing Countries Trading Scheme (DCTS). As such, apparel exports from Bangladesh are benefitting from an 11.5 per cent margin of preferences, against 6.5 per cent for Vietnam and 2.3 per cent for India. After graduation and the transition period, Bangladesh will get Enhanced Preferences in the UK (Razzaque at el, 2023). Under Enhanced Preference, the tariff rate for apparel items is zero, therefore, the country will continue enjoying duty-free exports for apparel. However, a loss of competitiveness may arise due to the UK-Vietnam FTA, which will allow tariff-free exports of apparel from Vietnam.

[10] The margin of preference is the difference between the MFN rate and the tariff rate under a specific GSP tier.

Table 1: Tariff profiles of apparel items for major comparators of Bangladesh in the EU

Country	Current trading scheme, tariff rate and margin of preferences			Trading scheme, tariff rate and margin of preferences after 2029		
	Tariff scheme	Tariff rate (%)	Margin of preferences (%)	Tariff scheme	Tariff rate (%)	Margin of preferences (%)
Bangladesh	Everything But Arms (EBA)	0	11.8	GSP+	0	11.8
				Standard GSP	9.5	2.3
China	Most Favored Nation (MFN)	11.8	0	No change		
Vietnam	Free Trade Agreement (FTA)	5	6.8	FTA	0	11.8
Sri Lanka	GSP+	0	11.8	No change		
India	Standard GSP	9.5	2.3	No change		
Pakistan	GSP+	0	11.8	No change		
Cambodia	Everything But Arms (EBA)*	0	11.8	Subject to graduation in 2027, Cambodia's preferential scheme may change in 2030		

* EBA preferences for Cambodia has been suspended temporarily

Source: Authors' analysis using WITS data.

Table 2: Tariff profiles of apparel items for major comparators of Bangladesh in the UK

Country	Current trading scheme, tariff rate and margin of preferences			Trading scheme, tariff rate and margin of preferences after 2029		
	Current tariff scheme	Current tariff rate (%)	Margin of preference (%)			
Bangladesh	Comprehensive Preferences (CP)	0	11.5	Enhanced Preferences (EP)	0	11.5
China	Most Favored Nation (MFN)	11.5	0			
Vietnam	Free Trade Agreement (FTA)	5	6.5	FTA	0	11.5
Sri Lanka	Enhanced Preferences (EP)	0	11.5	No change		
India	Standard Preferences (SP)	9.2	2.3	No change		
Pakistan	Enhanced Preferences (EP)	0	11.5	No change		
Cambodia	Comprehensive Preferences (CP)	0	11.5	Subject to graduation in 2027, Cambodia's preferential scheme may change in 2030		

Source: Authors' presentation using WITS data.

III. Methodology and Estimation Framework

Traditionally, trade elasticities are estimated either based on cross-sectional (cross-country and cross-industry) variation of trade costs or based on time series variation stemming from variations in policies and fluctuation of exchange rates. Studies using a cross-sectional variation of countries or industries are known as micro studies. Micro studies yield high values for trade elasticity, generally greater than five in absolute values (Hillberry & Hummels, 2013).

On the other hand, studies using time-series variation are identified as macro studies and yield low estimates for the trade elasticity, around one or lower. Differences in the magnitude of elasticities are generally rationalised by terming cross-sectional elasticities as long-run elasticities capturing a snapshot of the steady state. In contrast, short-run elasticities from time series variation capture mainly the short-run volatility of exchange rates (Goldberg & Pavcnik, 2016). Since economic agents have more time to adjust their behaviour in the long run, the long-run trade elasticity is larger than the short-run elasticity.

However, using only time series or cross-sectional variations in estimating trade elasticities would result in biased, inconsistent, and inefficient estimates. Elasticity estimates will likely suffer from measurement errors and simultaneity bias when only time variation is used in estimation (Hillberry & Hummels, 2013). Similarly, they will likely suffer measurement errors and omitted variable bias when only cross-sectional variations in sectors or countries are used. Consequently, Shapiro (2014) uses panel data to estimate trade elasticities. As a result, estimated elasticities in Shapiro (2014) are closer to 1, similar to micro studies. Our paper overcomes these problems and uses three types of variations: time series, cross country, and cross product for the RMG industry. In addition, our sample contains data on 50 top RMG export items from 12 major source countries, including Bangladesh, for 20 years from 2000 to 2019. Thus, elasticity estimates in our paper are less likely to be underestimated or overestimated.

Our estimation framework uses the logit demand model proposed by McFadden (1973). In particular, our estimation framework for demand parameters and elasticities follows Berry, Levinsohn, and Pakes (1995), BLP henceforth. However, we limit our analysis to only estimating demand parameters as disaggregated industry-level cost data are not available for the RMG exporting countries. We use the information on prices, quantities, bilateral export values, and measurable characteristics of the RMG products, i.e., per unit weight of the item, to estimate the parameters of the demand system.

We specify the level of utility that a consumer receives from a given RMG product as a function of both a vector of individual characteristics, denoted by ζ, and a vector of product characteristics, say (x, ξ, p). Here *p* is the product's price, x is the observed product attributes, and ξ is the unobserved features of the product. Thus, the utility derived by consumer *i* from consuming product *j* is given by the scaler value:

$$U(\zeta_i, p_j, x_j, \xi_j ; \theta) \tag{1}$$

where θ is a vector of parameters to be estimated. Here consumers with different characteristics, ζ, choose a different variety of the same RMG products. An RMG product's variety is defined with respect to its country of origin. We integrate out the utility function over the distribution of ζin the population to derive the aggregate demand system. We assume that the distribution of ζ is known. Formally, consumer *i* chooses a variety *j* if and only if:

$$U\big(\zeta_i, p_j, x_j, \xi_j ; \theta\big) \geq U(\zeta_i, p_r, x_r, \xi_r ; \theta), \qquad for \quad r = 0, 1, \ldots, J. \tag{2}$$

where alternatives $r = 0, 1, \ldots, J$ are competing RMG products differentiated based on their country of origin. We use a functional form for the utility function that is additive in individual and product characteristics:

$$U(\zeta_i, p_j, x_j, \xi_j ; \theta) \equiv x_j\beta - \alpha p_j + \xi_j + \epsilon_{ij} \equiv \delta_j + \epsilon_{ij} \quad (3)$$

Where $\delta_j = x_j\beta - \alpha p_j + \xi_j$ and the mean of the ϵ vector in the population of consumers is assumed to be zero so that for each *j*, ξ_j is the mean across consumers of the unobserved component of utility, and δ_j is the mean utility from good *j*. The additive separability of the utility function has certain limitations for estimating demand elasticities when products differ substantially based on their characteristics. This is because (3) generates aggregate substitution patterns and responses to introducing new products that cannot possess many desirable features, especially for products with significantly diverse characteristics, such as automobile varieties. This implies that cross-price elasticities between any two products depend only on their market share and are independent of other alternatives. This issue of independence of irrelevant alternative property of the logit model does not seem to be very restrictive for the top RMG products of Bangladesh. Generally, Bangladesh produces and exports low-end and low-value-added RMG products. These products are less likely to differ in characteristics from similar competing products from other RMG exporting countries.

In (3), $\epsilon's$ are the only elements of the vector of consumer characteristics, ζ. Now, we assume that individual characteristics ϵ_{ij} is independent of the observed product characteristics, x_j. Since, in our estimation, products are differentiated only based on their country of origin, it is unlikely that ϵ_{ij} and x_j are correlated. We further assume that ϵ_{ij} are distributed multivariate type I extreme value, which provides the share of each variety as a logistic function product characteristics:

$$s_j = \frac{\exp(x_j\beta - \alpha p_j + \xi_j)}{1 + \sum_{m=1}^{J} \exp(x_m\beta - \alpha p_m + \xi_m)} \quad (4)$$

Taking natural log on both sides of (4) yields:

$$lns_j = x_j\beta - \alpha p_j + \xi_j - ln\left(1 + \sum_{m=1}^{J} \exp(x_m\beta - \alpha p_m + \xi_m)\right) \quad (5)$$

Here (5) is the regression equation that we estimate to compute the demand parameters, where $ln\left(1 + \sum_{m=1}^{J} \exp(x_m\beta - \alpha p_m + \xi_m)\right)$ is the constant term and ξ_j are unobserved errors and are assumed to have zero mean. (5) is our benchmark regression implied by the logit demand model. Since we use disaggregated RMG export data for several years, we include time-fixed effects in addition to per item weight in kilogram. Moreover, we include import-market-fixed and product-fixed effects in (5) to capture the impact of other determinants of demand. Thus, the vector x_j Includes all these three types of fixed effects (time, import market, and product) to account for the dynamics of the demand system fully. The own- and cross-price elasticities are then defined as in Vincent (2015):

$$s_{jk} = \begin{cases} -\alpha p_j(1 - s_j) & if\ j = k \\ \alpha p_k s_k & if\ j \neq k \end{cases} \quad (6)$$

Because shares are often small, own-price elasticities will be proportional to price. This suggests that cheaper products are less elastic and have higher markups over marginal costs. While this assumption is implausible for many industries, we argue that this is not the case for the RMG industry. Instead, cheaper RMG products tend to be less price elastic.

Price endogeneity

Recent literature that attempts to estimate trade elasticities using micro datasets and addresses several econometric issues, such as endogeneity bias, heteroskedasticity, and zero trade flows (Caliendo & Parro, 2015; Imbs & Mejean, 2017; Soderbery, 2018; Farrokhi & Soderbery, 2021; Boem, Levchenko, & Pandalai-Nayar, 2023; Tyazhelnikov & Zhou, 2021; Fontagne, Guimbard, & Orefice, 2022). In our estimation framework, prices in (5) could potentially be endogenous as we use the per-unit prices. Since we control import market- and product-fixed effects, endogeneity from the demand side is less likely to be a problem. However, supply-side factors could be correlated to prices producing an inconsistent estimate of the price coefficient. For example, if producers know the nature of the unobserved component ξ_j of the mean utility from good *j*, prices are likely to be correlated with ξ_j. This creates the classic simultaneity problem in analysing demand, supply, and market equilibrium. Hence, we instrument prices using a number of supply-side fixed effects. For the demand-side model where $E\left(\xi_j \xi_j' \middle| x_j\right) = I_J \sigma_\xi^2$, the Chamberlain (1987) defined optimal instruments

$$z_j^* = E\left(\frac{d\xi_j}{d\theta} | x_j\right)$$

Where $\theta = (\alpha, \beta)$. This is the conditional expectation of the derivative of the conditional-moment restriction with respect to vector θ. As demonstrated by Chamberlain (1987), z_j^* minimises the asymptotic covariance matrix of the estimator $\hat{\theta}$. Most applications of the BPL model use instruments that represent series approximations of z_j^*. Reynaert and Verboven (2014) proposed two sets of instruments: (1) x_j and their squares and interactions, (2) sums of the characteristics of other products $\sum_{m=1,m\neq j}^{J} x_m$. In our estimation, we use exporter fixed effects, per item weight x_j and their interactions with the exporter fixed effects, and sums of the characteristics of other products $\sum_{m=1,m\neq j}^{J} x_m$along with the year fixed effects for instrumenting prices. We obtain the two-stage least square (2SLS) and GMM estimates of (5) using these instruments. 2SLS and GMM estimates of price coefficients are less likely to suffer from endogeneity, and these estimates provide us with precise estimates of the own- and cross-price elasticities.

Data and descriptive statistics

We use annual data of annual RMG import of 50 products from the top 12 supplier countries. These 50 products are the top RMG exporting items from Bangladesh. We report averages of the three main variables used in our estimation: price, quantity, and weight per item in Table 3. Here the price is the per

item price, measured in Euro. The average price per item for these selected 50 products has been stable over the last two decades, ranging between 4 to 6 Euros.

Table 3: Average values of prices, quantities, and per-item weight of RMG products

Year	All Exporting Countries			Bangladesh		
	Price	Quantity (items)	Weight per item	Price	Quantity (items)	Weight per item
2000	5.851869	597614.1	0.349995	5.054811	995296.4	0.338935
2001	5.832181	909185	0.342367	5.174776	5630995	0.334964
2002	5.649046	527473.9	0.352586	4.958947	974284.3	0.353685
2003	5.478849	575468.5	0.356529	4.519498	1217023	0.347585
2004	5.239616	621018.3	0.340768	4.151931	1507915	0.350734
2005	4.688541	861457	0.337896	3.611606	1521774	0.34643
2006	4.843909	888626.9	0.337772	3.612975	1832646	0.338381
2007	4.817941	1043158	0.327497	3.435794	2094523	0.318184
2008	4.794326	1078134	0.315246	3.31876	2214817	0.313987
2009	4.91061	1075122	0.311537	3.526793	2199820	0.308155
2010	5.135233	1126647	0.343805	3.866613	2425371	0.318487
2011	5.357949	1112324	0.334503	4.317244	2518433	0.306653
2012	5.474084	1049665	0.32784	4.485055	2630774	0.304153
2013	5.358393	1107957	0.323897	4.34066	3101681	0.301667
2014	5.206953	1215727	0.31759	4.33385	3436176	0.307499
2015	5.630565	1171327	0.316034	4.934779	3506435	0.306685
2016	5.613758	1207137	0.314286	4.728451	3882852	0.300508
2017	5.517338	1200935	0.316922	4.694844	3956515	0.303807
2018	5.407109	1222556	0.320181	4.346509	4296782	0.306465
2019	5.653753	1179200	0.325987	4.629517	4357992	0.311867
Total	5.315834	993860.1	0.330591	4.306581	2788464	0.320723
Source: Authors' estimation using EU ComEXT data						

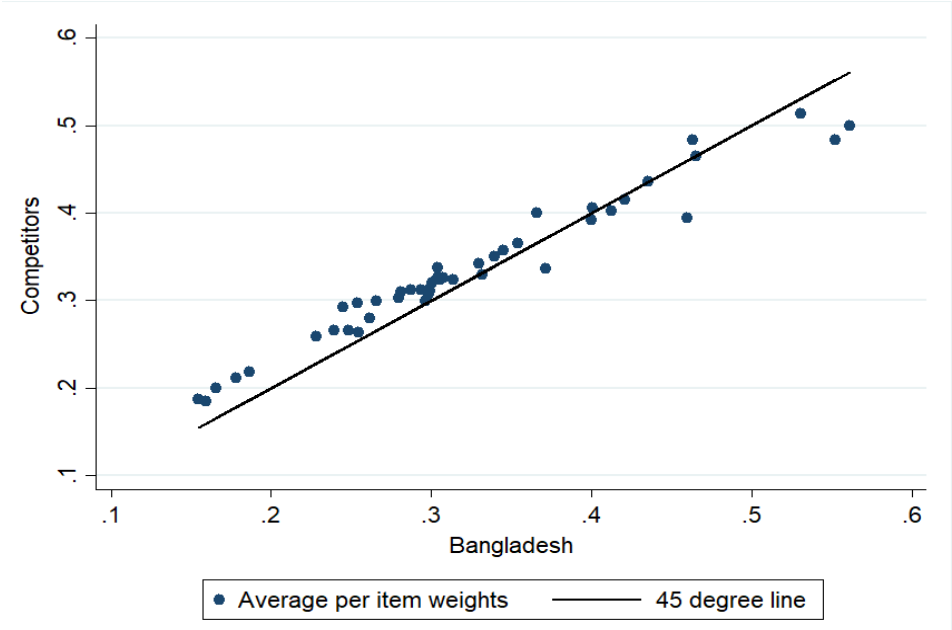
One problem with the price variable is that prices were missing for many bilateral trades, and prices were generally misreported for a smaller quantity of imports. We address this issue by imputing the median price of the item in an import market for a given year for the missing and outlier prices. Average per-item prices appear to be smaller than the overall prices. Lower average prices for RMG exports from Bangladesh could result from two sources. First, Bangladesh can produce these items at lower costs than its major competitors, and so Bangladesh can export the same item at a lower price. Second, and most importantly, Bangladesh enjoys preferential treatment in the EU market compared to its major export competitors, which helped Bangladesh keep the export price low.

We use the information on the total number of items of a particular product imported into EU countries from each of the 12 supplier countries to compute the shares of imports in each market, which are given in Table 4. There are wide variations in the average number of items of all products imported into the EU

markets for different years. However, for most of the last two decades, the average number of items of these 50 products exported from Bangladesh has been larger than the overall average. This indicates that Bangladesh is a major supplier of RMG products in the EU markets. In many instances, the average number of items of these 50 RMG products exported from Bangladesh is three to four times larger than the average of 12 countries combined.

Using the information on the weight in kilograms (kgs) of each bilateral trade for a certain RMG product, we compute the weight per item in kgs, shown in Table 1. We use per-item weight as the product characteristic and control it in our regression estimation. Table 1 shows that the average per-item weight for the chosen 50 products is about one-third of a kg, and there are some moderate variations in these averages over the years. The average weight per item for Bangladesh's RMG products is similar to that of all 12 exporting countries. However, these averages have been slightly lower for Bangladesh's RMG products for most of the last two decades. This implies that the RMG products exported from Bangladesh are differentiated from those exported by its major competitors. To illustrate the difference further, a scatter plot of the 20-year average per item weights of 50 RMG products between Bangladesh and its 11 major competitors is shown in Figure 11. From Figure 11, one can see that the weights are close to the 45-degree line but are not perfectly aligned on the line; per-item weights for most products in Bangladesh are slightly lower than its competitors.

Figure 6: Average per-item weights of Bangladesh's RMG products lower than its competitors



Source: Authors' estimation using EU ComEXT data

Table 4 reports the average and maximum share of 50 RMG products imported into the 28 EU countries from 12 major exporting countries, including Bangladesh. Table 3 shows that the average share of 50 products over the 28 EU countries is tiny for any exporting country in any given year. The average shares for the 12 exporting countries range between 0.1 to 1 per cent. This indicates that the intra-EU trade is

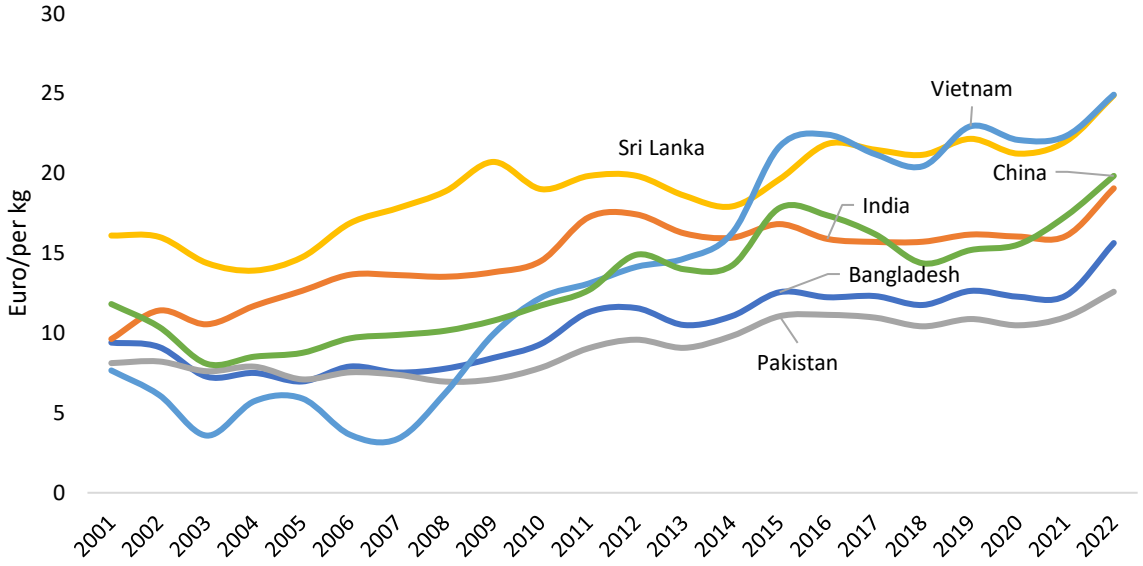
the primary supply source for these 50 RMG products. However, some exporting countries, such as Bangladesh and China, have had significant market shares in the last two decades. For instance, Bangladesh's maximum share of an RMG in the EU market ranges from 15 to 32 per cent in a given year. China's shares in RMG imports into the EU are also significant for some products, as China's maximum shares also range between 15 to 33 per cent. Interestingly, Bangladesh's maximum shares show an upward trend, while China's maximum shares show a downward trend in the EU market in the last two decades. This is because Bangladesh has achieved a significant customer base in the EU market over the previous 20 years and strengthened its foothold in the RMG market in the EU.

A comparison of prices obtained by different suppliers for apparel exports can shed light on export competitiveness and profit margins. However, drawing meaningful conclusions would be far from straightforward for two reasons. First, as discussed above, prices are generally absent in international trade. While most trade economists use unit prices while analysing trade data, they usually suffer from aggregation problems. Second, products supplied from different countries may substantially differ in quality (i.e., product differentiation). Therefore, analysis using aggregated data cannot account for this variation. Still, unit value comparisons can give important insight into the extent of competitiveness.

Figures 7 and 8 present unit value comparisons of knitwear and woven garments items exports to the EU from Bangladesh and its major non-EU comparators.[11] Due to the unavailability of quantity data at the aggregate level, the unit value is defined as Euro per kilogram of apparel exports. Over the years, Bangladesh and its major competitors observed an increasing trend in the unit values of both knitwear and woven garments. However, it is important to note that Bangladesh receives relatively lower unit prices in the EU compared to India, Sri Lanka, and Vietnam for both knitwear and woven garments. For knitwear products, the unit value for Vietnam is 60 per cent higher than in Bangladesh. It is more than 80 per cent higher than Bangladesh for woven garments. One potential reason for higher unit value for Vietnam and China could be accountable for their specialisation in high-value sophisticated apparel products. Pakistan receives the lowest unit value compared to major comparators for both woven and knitwear apparel items.

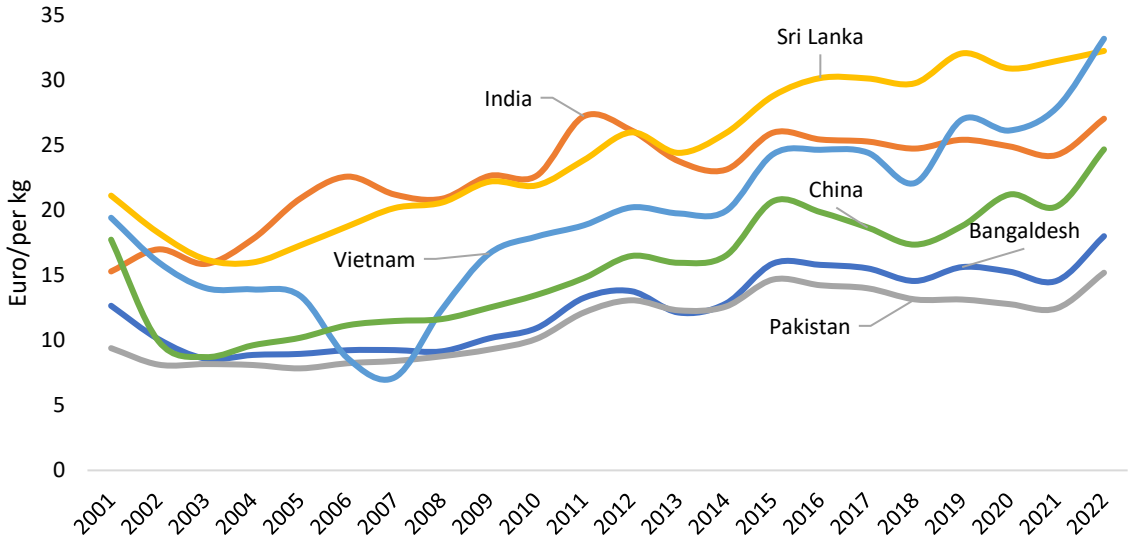
[11] Since the EU operates as a single market, they should not be considered as comparator of Bangladesh.

Figure 7: Unit value comparison of knitwear items in the EU



Source: Authors' presentation using EU ComEXT data

Figure 8: Unit value comparison of Woven garments in the EU



Source: Authors' presentation using EU ComEXT data

The unit value analysis using aggregated data could suffer from measurement error and could be biased for product variation. It is considered that there is little variation among products originating from different countries at the disaggregated level (at 8-digit or 10-digit level). The measurement errors in unit price also can somewhat be addressed using disaggregated product levels. Therefore, the same analysis has been undertaken for four major knitwear and four woven garments items of Bangladesh at disaggregated 8-digit level. The unit values for these items are defined as Euro per piece. Bangladesh's major knitwear exports to the EU consist of cotton t-shirts (HS61091000), women's jerseys of man-made fibres

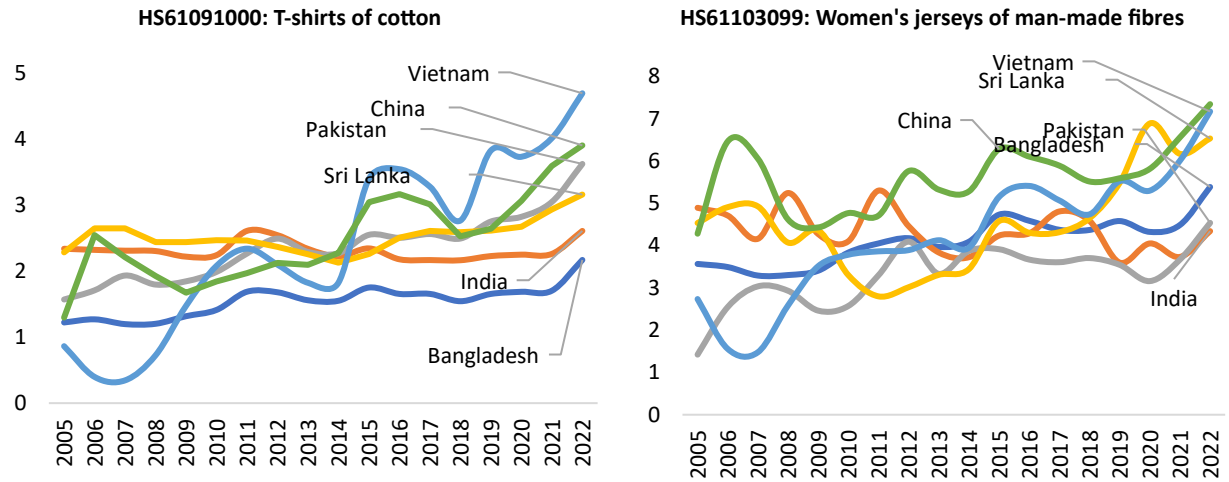
(HS61103099), women's jerseys of cotton (HS61102099), and women's cotton trousers (HS61046200). For the largest exporting knitwear item, cotton t-shirts, Bangladesh receives the lowest unit price among the major comparators. For other knitwear items, Bangladesh's unit price is much lower than China, Vietnam, and Sri Lanka.

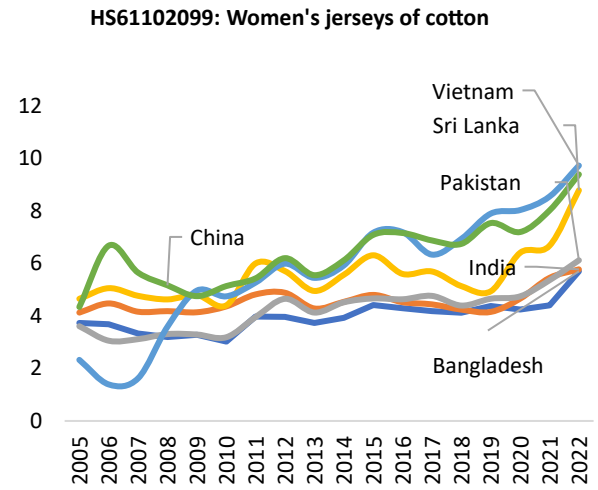
Within the woven products, the most significant exports to the EU from Bangladesh are men's trousers of cotton (HS62034235), men's trousers of denim (HS62034231), men's cotton shirts (HS62052000), and women's denim trousers (HS62046231). Across all four woven products, Bangladesh's unit prices is the lowest among all comparators (Figure 9).

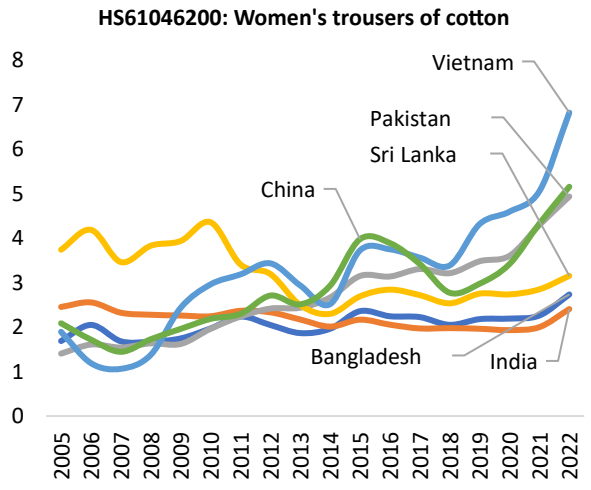
The lower unit price of Bangladesh's apparel products serves as a strong indicator of its export competitiveness when compared to its rivals in the market. This price advantage is closely tied to Bangladesh's advantageous position of enjoying duty-free export privileges to the European Union, a factor that significantly contributes to the lower price of its apparel items. This phenomenon has been extensively explored in academic literature, particularly through the concept of "tariff passthrough," which highlights that a portion of the benefits derived from duty-free access are passed on to importers, thus facilitating lower prices for consumers.

As a result, even after Bangladesh graduates from its Least Developed Country (LDC) status, a transition that may entail the replacement of duty-free preferences with less favourable trade preference schemes or the application of Most Favored Nation (MFN) duties, Bangladesh can potentially maintain its competitiveness within the European markets. This resilience can be attributed to the fact that, despite potential increases in unit prices due to the loss of duty-free access, Bangladesh's apparel products may remain competitively priced in comparison to other sources.

Figure 9: Bangladesh's top four knitwear export item's unit value in the EU (Euro/piece)

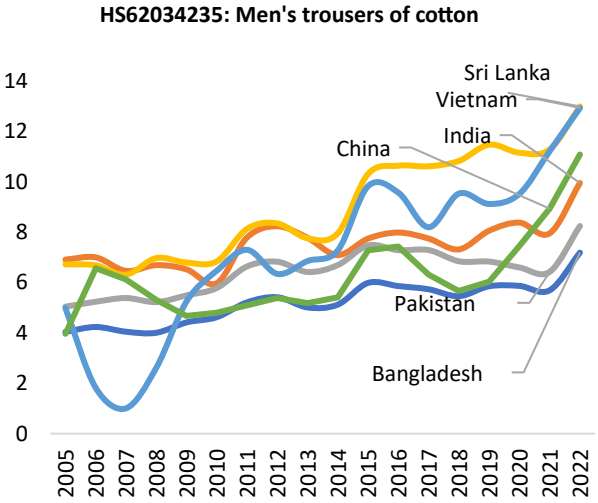


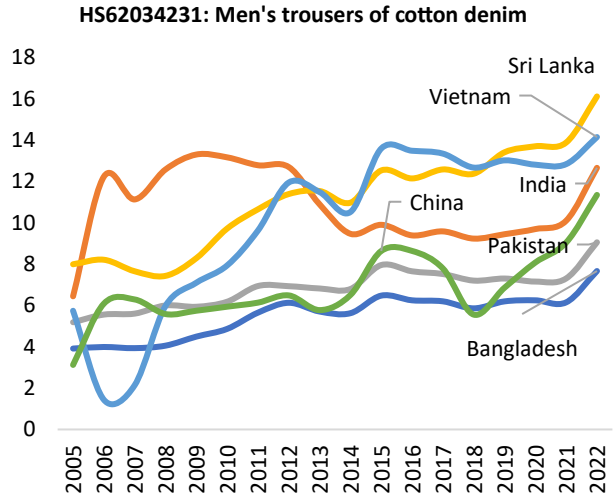


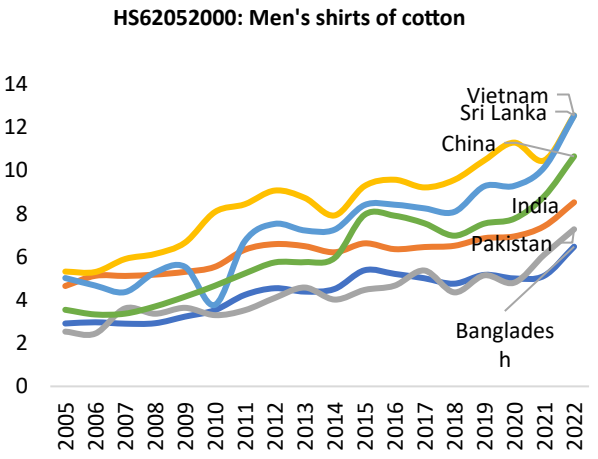


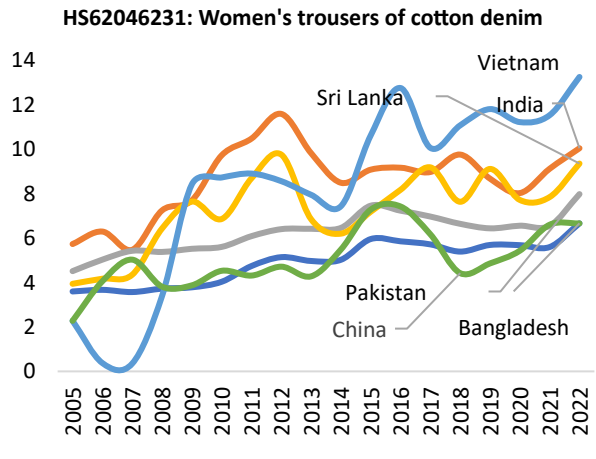
Source: Authors' presentation using EU ComEXT data

Figure 10: Bangladesh's top four woven garment export item's unit value in the EU (Euro/piece)









Source: Authors' presentation using EU ComEXT data

IV. Results

We estimate (5) using both 2SLS and GMM methods, and the results are shown in Table 5. We provide estimates of three specifications of each technique by including three different fixed effects successively. These are year-fixed effects, import market fixed effects, and product-fixed effects. All these fixed effects capture the various determinants on the demand side. As mentioned in the methodology section, prices are instrumented by the exporter's fixed effects along with product characteristics and their interactions with the exporter's fixed effects, and the fixed effects are included in the second stage estimation. Here, we assume that the exporter fixed effects are determined by the supply conditions and hence uncorrelated with the demand factors. This justifies the exogeneity of the instruments. The instruments' validity can be seen from the first-stage estimates as reported in Table 5. The F-statistics are significantly larger than 10, where 10 is the rule-of-thumb value for F-statistics for the empirical validity of the instruments.

Results of the estimated coefficients without the import market and product fixed costs are in (1) and (4) for 2SLS and GMM, respectively. These coefficients are very similar and have expected signs. The estimated price coefficient without importer and product market fixed effects is about -0.35, implying that one Euro price increase leads to a 35 per cent decrease in the market share. Since the average price is about 5 Euro, one Euro rise is equivalent to a 20 per cent increase in price. On the other hand, the price coefficients become almost double when we control the import market and product fixed effects. The estimated coefficient is now about -0.7, indicating a 70 per cent fall in the share in response to a 1 Euro increase in price, indicating a one per cent increase in price causes a 3.5 per cent fall in market share, holding other per item weight fixed. Thus, we have more elastic demand parameters when we control for import market and product fixed effects. This is likely to be the case as these RMG products are at a highly disaggregated level, and elasticities of demand are supposed to be larger for the narrower market definition.

Table 4: Top 10 Exporters' share in the total value of the EU import of top 50 RMG products from the rest of the World

Year	Bangladesh		China		India		Cambodia		Morocco		Myanmar		Pakistan		Tunisia		Turkey		Viet Nam	
	Mean	Max	Mean	Max	Mean	Max	Mean	Max	Mean	Max	Mean	Max	Mean	Max	Mean	Max	Mean	Max	Mean	Max
2000	0.003	0.159	0.006	0.149	0.003	0.067	0.001	0.018	0.003	0.102	0.001	0.015	0.001	0.021	0.003	0.085	0.005	0.181	0.001	0.086
2001	0.003	0.161	0.006	0.183	0.003	0.070	0.001	0.020	0.003	0.081	0.001	0.014	0.001	0.021	0.003	0.092	0.005	0.159	0.001	0.086
2002	0.003	0.149	0.008	0.263	0.003	0.084	0.001	0.025	0.003	0.072	0.001	0.019	0.001	0.025	0.003	0.063	0.005	0.142	0.001	0.062
2003	0.003	0.154	0.008	0.225	0.003	0.094	0.001	0.026	0.003	0.122	0.000	0.020	0.001	0.025	0.003	0.073	0.005	0.149	0.001	0.036
2004	0.003	0.187	0.009	0.246	0.003	0.109	0.001	0.037	0.003	0.122	0.001	0.014	0.001	0.036	0.003	0.075	0.005	0.157	0.001	0.030
2005	0.003	0.160	0.012	0.237	0.004	0.123	0.001	0.048	0.004	0.103	0.000	0.020	0.001	0.025	0.003	0.079	0.006	0.146	0.001	0.028
2006	0.004	0.146	0.012	0.243	0.004	0.132	0.001	0.041	0.004	0.079	0.000	0.018	0.001	0.023	0.003	0.067	0.005	0.133	0.001	0.031
2007	0.004	0.179	0.014	0.270	0.004	0.128	0.001	0.029	0.004	0.076	0.000	0.018	0.001	0.034	0.003	0.073	0.006	0.162	0.001	0.041
2008	0.004	0.185	0.016	0.294	0.004	0.128	0.001	0.028	0.004	0.091	0.000	0.016	0.001	0.037	0.003	0.065	0.005	0.159	0.001	0.050
2009	0.004	0.212	0.016	0.330	0.004	0.150	0.001	0.021	0.004	0.100	0.000	0.009	0.001	0.033	0.003	0.056	0.004	0.166	0.001	0.050
2010	0.005	0.221	0.016	0.289	0.003	0.108	0.001	0.032	0.004	0.090	0.001	0.027	0.001	0.027	0.003	0.042	0.005	0.181	0.001	0.049
2011	0.006	0.229	0.016	0.309	0.004	0.126	0.001	0.071	0.003	0.105	0.001	0.017	0.001	0.047	0.003	0.041	0.004	0.190	0.001	0.047
2012	0.007	0.286	0.015	0.283	0.003	0.102	0.002	0.067	0.003	0.126	0.001	0.016	0.001	0.037	0.002	0.035	0.005	0.166	0.001	0.054
2013	0.008	0.267	0.014	0.293	0.003	0.092	0.002	0.121	0.003	0.114	0.001	0.016	0.001	0.036	0.002	0.038	0.005	0.159	0.002	0.061
2014	0.008	0.295	0.013	0.262	0.004	0.101	0.002	0.176	0.003	0.116	0.001	0.019	0.001	0.054	0.002	0.036	0.004	0.150	0.002	0.072
2015	0.009	0.324	0.012	0.237	0.004	0.099	0.002	0.150	0.003	0.091	0.001	0.020	0.002	0.067	0.002	0.031	0.004	0.136	0.002	0.042
2016	0.010	0.289	0.011	0.212	0.004	0.118	0.003	0.093	0.003	0.087	0.001	0.017	0.002	0.068	0.002	0.029	0.004	0.122	0.002	0.079
2017	0.010	0.279	0.011	0.199	0.004	0.120	0.003	0.089	0.003	0.120	0.001	0.023	0.002	0.064	0.002	0.034	0.004	0.121	0.002	0.113
2018	0.010	0.236	0.010	0.177	0.003	0.126	0.003	0.106	0.003	0.104	0.002	0.041	0.002	0.058	0.002	0.032	0.004	0.115	0.002	0.083
2019	0.010	0.210	0.009	0.153	0.003	0.105	0.003	0.119	0.003	0.093	0.002	0.046	0.002	0.058	0.002	0.030	0.004	0.098	0.002	0.060

Source: Authors' estimation using EU ComEXT data

The coefficient of per item weight is about 2.5 when we only control for year-fixed effects, whereas it is about 3.5 when we control import market and product fixed effects in addition to year-fixed effects. This means that a one-kilogram increase in per item weight leads to a more than 300 per cent increase in market share., holding price constant. Since the average per-item weight is about 0.33 kilograms, a one-kilogram increase means a 300 per cent increase. Thus, per-item weight affects the market share slightly higher than the one-to-one proportion. Table 5 includes the second stage Wald $\chi 2$, which shows the overall robustness of the estimated models. From the table, we can see that the Wald $\chi 2$ is the largest in the case of GMM estimate with year, import market, and product fixed effects. Hence, we use the demand parameters in column (6), parameters estimated using the GMM approach with the year, importer, and product fixed effects, to compute the price elasticities of demand.

Table 5: Estimates of demand parameters

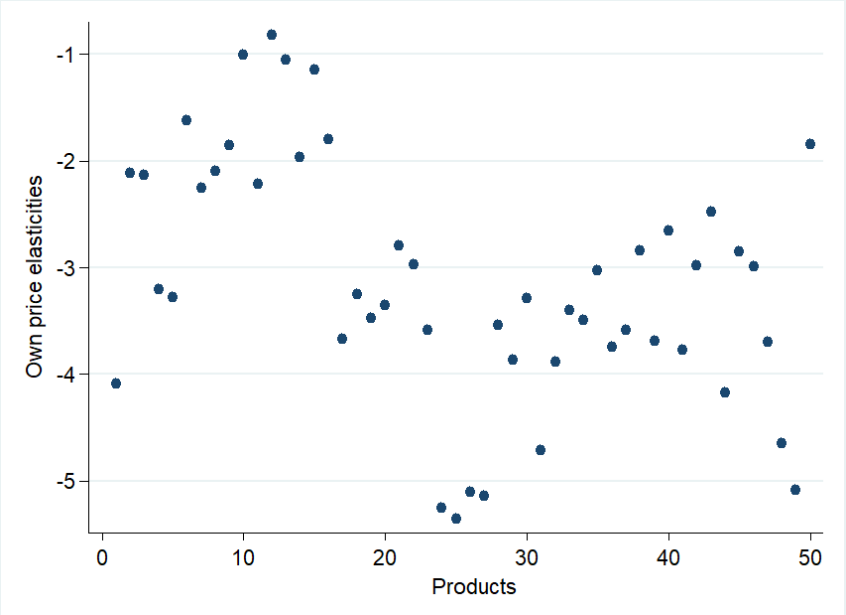
	2SLS			GMM		
Variable	(1)	(2)	(3)	(4)	(5)	(6)
Price	-0.346	-0.698	-0.692	-0.359	-0.779	-0.718
	(0.0098)	(0.0974)	(0.0988)	(0.0101)	(0.0092)	(0.0083)
Per item weight	2.674	5.533	3.594	2.523	5.796	3.585
	(0.0934)	(0.7586)	(0.5638)	(0.0977)	(0.0907)	(0.0983)
Constant	-6.934	-8.08	-8.162	-6.876	-7.604	-7.924
	(0.0492)	(0.2649)	(0.297)	(0.0508)	(0.0539)	(0.06529)
Year fixed effect	Yes	Yes	Yes	Yea	Yes	Yes
Importer fixed effect	No	Yes	Yes	No	Yes	Yes
Product fixed effect	No	No	Yes	No	No	Yes
First stage F	632.70	1059.34	1531.91	1288.37	975.87	1165.56
Second stage Wald $\chi 2$	308.64	5426.59	3160.31	1712.07	69857.18	82276.32
Observations	163637	163637	163637	163637	163637	163637

Source: Authors' estimation using EU ComEXT data

Using the GMM estimates of the demand parameters of column (6) in Table 5, we compute the own-price elasticities of Bangladesh's top 50 RMG products in the 28 EU countries from 2000 to 2019. Figure 12 shows a binscatter plot of medians of these elasticities over the 28 EU markets and 20 years. The distribution of the own-price elasticities of each of these products is shown as the box plots in Figure A2 in the appendix. A couple of points are worth noting from Figure 12. First, there are vast variations in the own-price elasticities of the RMG products; the median elasticities range from slightly lower than 1 to more than 5 in absolute values. Second, for most of the products, the median elasticities are larger than 3 in absolute values, indicating that most RMG products of Bangladesh have highly elastic demand. This implies that when Bangladesh loses its tariff-free access to the EU markets after the LDC graduation, Bangladesh is at risk of losing a significant market share for these RMG products. Third, for a few products, the median elasticities are less than or close to 1 in absolute values. This suggests that Bangladesh has achieved significant market power for a few RMG products in the EU markets. Therefore, if the prices of these products go up after the LDC graduation, the demand for Bangladesh's RMG products would unlikely be sharply declined.

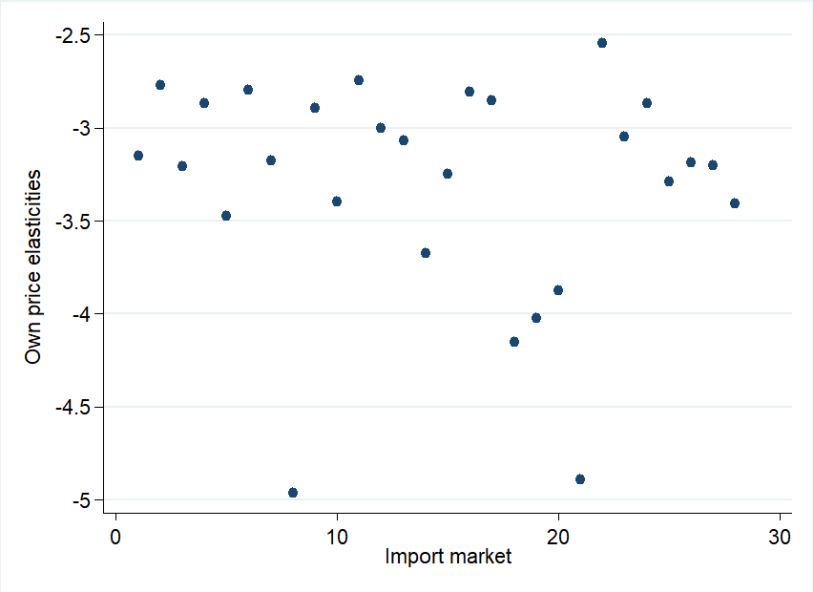
However, when we show medians of own-price elasticities of Bangladesh's top 50 RMG products over the 20 years in the 28 EU markets, it indicates that the demands for Bangladesh's RMG products are highly elastic in the EU markets, as shown in Figure 13. The median elasticities of Bangladesh's top 50 RMG products vary from 2.5 to more than 5 in absolute values. With these highly elastic demands, RMG products of Bangladesh are vulnerable in the EU markets to any price shock, such as losing preferential treatment after the LDC graduation. The detailed distributions of own-piece elasticities of demand for Bangladesh's RMG products in the 28 EU markets are shown as box plots in Figure A3 in the appendix.

Figure 12: Median own price elasticities of Bangladesh's top 50 RMG products



Source: Authors' estimation using EU ComEXT data.

Figure 13: Median own price elasticities of Bangladesh's RMG products in the 28 EU markets



Source: Authors' estimation using EU ComEXT data

To investigate the elasticities of the top RMG products of Bangladesh in major EU markets, which are Germany, Spain, the UK, and Italy, we create the scatter plots elasticities in each of these markers. These are shown in Figure 14.

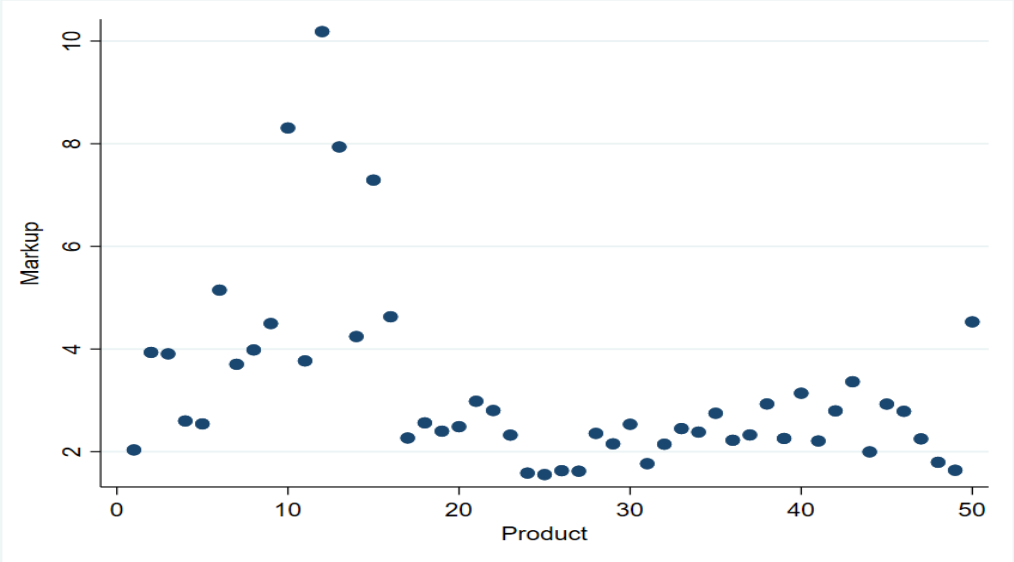
Figure 14: Own-price elasticities for Bangladesh's RMG products in four major EU markets

Source: Authors' estimation using EU ComEXT data

Figure 14 shows that most RMG products in Bangladesh have fairly high own-price elasticities of demand in major importing markets. Though the patterns of own-price elasticities in these four major importing countries of Bangladesh's RMG products are similar, there are wide variations in these elasticities across and within each country. Most products have own-price elasticities between -2 and -4, and only a few are greater than -1 or close to -1 in the four main markets for Bangladesh's RMG products. These elasticities appear more elastic in the UK and Italy than in Germany and Spain. However, in all four markets, Bangladesh's RMG products are highly price sensitive, implying a significant loss in market share for most of these products in these four major importing countries when Bangladesh loses the preferential tariff treatment because of LDC graduation.

We have utilised the estimated own-price elasticities to calculate the markups of Bangladesh's top 50 RMG products across the 28 EU countries, spanning from the year 2000 to 2019. In Figure 14, one can observe the medians of these markups presented over two decades and across the diverse EU markets. For a more comprehensive understanding of the distribution of own-price elasticities for each product, please consult the box plots provided in Figure A4 within the appendix. Several noteworthy insights are discernible from Figure 14. Firstly, it becomes apparent that significant variations exist in the markups of RMG products, with median markups ranging from just under 1 per cent to surpassing 10 per cent. Secondly, a salient observation is that, for the majority of these products, the median markups predominantly remain below 4%. This implies that a substantial portion of Bangladesh's RMG product range exhibits relatively low markups. Consequently, when Bangladesh's tariff-free access to EU markets concludes following its LDC graduation, exporters for many of these products could face formidable challenges in adapting to a price shock as substantial as 10 per cent. Thirdly, a select few products do exhibit large median markups. This suggests that Bangladesh has effectively established significant market power for specific RMG products within European markets. Therefore, exporters dealing in these products should possess the capability to withstand the price increase resulting from preference erosion.

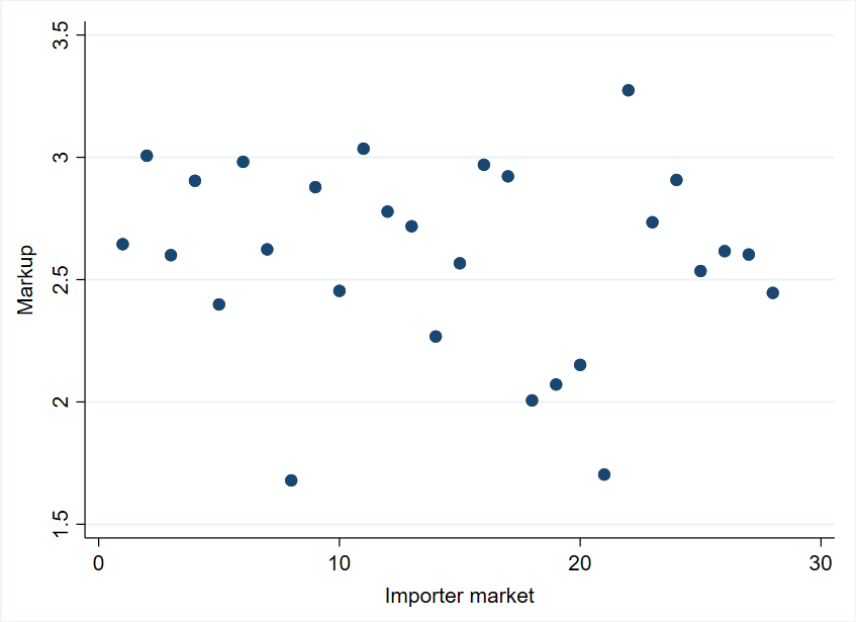
Figure 14: Median markups of Bangladesh's top 50 RMG products



Source: Authors' estimation using EU ComEXT data

However, when we show medians of markups of Bangladesh's top 50 RMG products over the 20 years in the 28 EU markets, it indicates that the median markups are even, as shown in Figure 15. The median markups of Bangladesh's top 50 RMG products vary from 1.5 to more than 3.5. With these small markups, RMG products of Bangladesh are vulnerable in the EU markets to any price shock, such as losing preferential treatment after the LDC graduation. The detailed distributions of own-piece elasticities of demand for Bangladesh's RMG products in the 28 EU markets are shown as box plots in Figure A5 in the appendix.

Figure 13: Median markups of Bangladesh's RMG products in the 28 EU markets



Source: Authors' estimation using EU ComEXT data

V. Policy Implications

Bangladesh's RMG sector has prospered, in part, owing to its status as an LDC, which has granted it preferential trade agreements in key markets. As Bangladesh approaches its graduation from LDC status, especially in the EU and UK markets, it confronts an uncertain future. This study sheds light on a crucial aspect of market dynamics – the relatively high elasticity of demand for Bangladesh's top 50 RMG products in the EU and the UK. The own-price elasticities, ranging between 3 and 4 in absolute terms, highlight the significant impact of price changes on the quantity demanded. Consequently, although some RMG products command high markups, the majority fall within the range of 2 to 4. An in-depth analysis of individual markets paints an even more intricate picture, revealing a median markup that tends to be lower. These findings underscore the pricing challenges and vulnerabilities faced by Bangladeshi exporters as they strive to maintain competitiveness in the post-LDC period.

Although our estimates indicate that Bangladesh's RMG products are highly elastic and have low markups, it's crucial to consider the plausibility of these results. Several factors support tend to support these findings. Firstly, the production technology for most RMG products in Bangladesh is simple and labour-intensive. Consequently, it is relatively easy and cost-effective to adjust production levels in response to changes in demand. Secondly, Bangladesh primarily manufactures basic RMG products with lower value-added content. As a result, consumers tend to be more price-sensitive when it comes to these products and may switch to alternatives if prices increase significantly. Thirdly, the Bangladeshi RMG sector faces intense competition, which exerts downward pressure on markups. However, it is worth noting that there

is no recent literature providing estimates of the elasticities of Bangladesh's RMG products, nor any studies estimating markups. As a result, we lack prior estimates for comparison. Nevertheless, the aforementioned factors support the credibility of our estimates.

As our findings reveal that most of Bangladesh's RMG products exported to the EU and the UK command low markups, one might wonder: how does Bangladesh's RMG industry thrive despite these low markups? Bangladesh's RMG industry has flourished due to a combination of factors. Firstly, Bangladesh's LDC status grants it preferential access to numerous markets, including the EU and the UK. This preferential access enables Bangladeshi RMG exporters to benefit from lower tariffs and reduced trade barriers, providing them with a competitive advantage over producers from other countries. Secondly, the Bangladesh government extends substantial support to the RMG sector through various measures and especially by providing cash incentives (in the range of 4—7 per cent of FOB value of exports) and tax breaks. This government support could have enabled them maintaining profitability even with low markups. Thirdly, Bangladesh boasts a large and relatively low-cost workforce. This endows Bangladeshi RMG producers with a significant cost advantage over producers from other countries, such as China and Vietnam.

Nonetheless, Bangladesh's RMG sector will encounter several challenges in the post-LDC era. Firstly, after Bangladesh's graduation from LDC status, it could lose preferential access to various markets, including the EU. Secondly, the Bangladesh government's ability to provide the same level of support to the RMG sector will diminish upon its graduation from LDC status. Specially, as per WTO rules, it will not be possible to provide export subsidies. Given the low markups, the discontinuation of export subsidies could seriously undermine export profitability. Thirdly, Bangladesh's labour costs have been steadily rising in recent years, driven by factors such as inflation and the heightened demand for skilled workers. This may render it more challenging for Bangladeshi RMG producers to compete with producers from other countries with lower labour costs. Additionally, concerns regarding safety, compliance, and environmental matters will be critically evaluated in the post-LDC era and, despite making improvements in recent years, these areas could continue to attract attention in sourcing decisions from Bangladesh.

Yet another factor that can also undermine export competitiveness is trade agreements involving the EU and other third countries that export garments. LDCs like Bangladesh, which currently benefit from unilateral non-reciprocal market access, could experience preference erosion as other nations secure free trade agreements with major trading partners, such as the EU. While graduation from LDC status inherently implies a loss of preferences, the situation could exacerbate if non-LDC nations begin to receive duty-free preferences due to free trade agreements, thus becoming more appealing supply sources. The recently signed EU-Vietnam and UK-Vietnam free trade agreements (FTAs) are examples in this respect. Under these FTAs, EU and UK tariffs on clothing imports from Vietnam will be phased out from an average of 9 per cent to zero by 2027. By contrast, Bangladesh's duty-free access to the same market is set to expire in 2029 (given the EU's additional three-year transition period for graduating LDCs), when it is projected to face an average tariff of about12 per cent. Currently, the EU is negotiating FTAs with India and Indonesia that are also important apprel exporting countries.

In light of the potential challenges facing Bangladesh's RMG sector in the EU and UK markets post its LDC graduation, a pertinent question emerges: To what extent might the sector be adversely affected, and are there underlying opportunities or silver linings amidst these challenges?

Over the years, Bangladesh has cultivated substantial ties with numerous global buyers and established brands, securing its integral position within international supply chains. This strategic integration is further strengthened by the its demonstrated capacity for bulk production. Given these established connections and a consistent record of delivery, it is plausible that importers may exhibit reluctance to divert sourcing, even if Bangladeshi exports face tariff increases. The continuity and reliability offered by Bangladesh might be deemed more valuable than the immediate cost implications of elevated tariffs.

Bangladesh holds a significant market share in the apparel sectors of both the EU and UK. Given this dominance, the introduction of tariffs on its imports could lead to a general rise in garment prices across these markets.Any tariff-induced cost increases would likely affect the broader price landscape of apparel in the EU and UK. Consequently, even as tariffs might initially pose challenges, the subsequent market-wide price adjustments could provide Bangladesh with a buffer, allowing it to cushion some of the direct impacts of the tariff hikes.

While the imposition of tariffs could lead to market-wide price adjustments, there's also a possibility that only Bangladesh might experience these price increases. Empirical data suggests that the export prices (or unit values) from Bangladesh are notably lower compared to other nations. This discrepancy in pricing might be a result of importers factoring in the benefits of tariff-free market access during bargaining processes with suppliers. Further evidence indicates that a significant portion of these tariff preferences is retained by the importers themselves (Cirera, 2014). Consequently, with the introduction of tariffs, importers might be compelled to relinquish some of these previously enjoyed preference rents, potentially leading to price adjustments specific to Bangladeshi exports.

There are also other positive outlooks for Bangladesh. China's dominance in the apparel sector has seen a marked decline, a trend anticipated to persist. This shift can be attributed to China's strategic transition towards producing more technologically-intensive goods and geopolitical developments prompting Western buyers to diversify their sourcing. As China's market share diminishes, it opens avenues for other nations, including Bangladesh, to fill the void. Additionally, a continued expansion of the European clothing market is expected as income rises and clothing priducts are income elastic in nature. These dynamics—both the evolving landscape of global suppliers and the projected growth in European demand—present opportunities for Bangladesh to bolster its exports, independent of its relative positioning as a supplier.

To minimise the adverse effects and prepare the RMG sector for the challenges in the post-LDC graduation phase in the EU and UK markets, it becomes imperative to strategise and adapt. This study underscores several policy implications that can aid in sustaining the competitiveness of Bangladesh's RMG exports.

First, a pivotal strategy revolves around augmenting markups for Bangladesh's current RMG product range. This can be achieved by capitalising on cost efficiencies across various fronts. Investments in modernising infrastructure, optimising power, and utility resources, nurturing a skilled labour force, fostering adept management practices, adopting cutting-edge technologies, and implementing advanced supply-chain management techniques are essential steps. These endeavours not only reduce production costs but also enhance the overall value proposition of Bangladeshi RMG products in the global market.

Second, Bangladesh can strategically focus on high-value-added RMG products that inherently offer greater profit margins. By transitioning towards more sophisticated and niche market segments, the country can mitigate the impact of preference erosion and maintain a competitive edge. This approach entails investments in research and development, fostering innovation, and aligning the sector with evolving consumer preferences.

Third, many European countries are actively pursuing the "China plus one" policy to diversify their supply chains. Bangladesh can proactively look for such opportunities, positioning itself as a reliable alternative. By securing a share of these expanding markets, Bangladesh's RMG sector can not only counter preference erosion but also capitalise on the shifting dynamics of global trade.

VI. Conclusion

The imminent transition of Bangladesh from its status as a Least Developed Country (LDC) presents a dual set of challenges and opportunities for its vital garment export sector, especially concerning the EU and UK markets. Our exploration into the dynamics of Bangladesh's RMG exports has unveiled several critical insights.

Firstly, our study has underscored the high elasticity of demand and the presence of low markups for Bangladesh's top 50 RMG products in the EU and the UK. The own-price elasticities and markups, often falling within the range of 3 to 4 in absolute value, underscore the substantial impact of price fluctuations on the quantity demanded. This revelation highlights the susceptibility of Bangladesh's garment exports to potential price shocks due to the discontinuation of preferential tariffs post-LDC graduation.

Secondly, while the post-LDC graduation scenario in the EU and UK markets appears challenging for Bangladesh's garment sector, there are glimmers of hope. Bangladesh's position as a critical supplier of RMG products to these regions suggests that, despite the loss of trade preferences, RMG product prices may rise. This price uptick could potentially aid Bangladeshi exporters in cushioning the impact of preference erosion. Moreover, the well-established network between Bangladesh's RMG sector and global apparel brands offers some cause for optimism, with the prospect of preference rent sharing between exporters and importers.

However, to adeptly navigate the challenges and capitalise on the opportunities presented by this pivotal juncture, Bangladesh must adopt a strategic and adaptive approach. The following policy implications emerge from our study. Firstly, there is a pressing need to enhance markups for Bangladesh's existing RMG product range. This necessitates substantial investments in infrastructure modernisation, optimisation of

power and utility resources, skill development within the workforce, the promotion of efficient management practices, the integration of advanced technologies, and the implementation of sophisticated supply-chain management techniques. These measures can concurrently reduce production costs and elevate the overall value proposition of Bangladeshi RMG products on a global scale.

Secondly, Bangladesh should strategically pivot towards high-value-added RMG products with inherently superior profit margins. By venturing into more sophisticated and niche market segments, Bangladesh can better withstand preference erosion and maintain a competitive edge. This shift will demand substantial investments in research and development, the fostering of innovation, and alignment with evolving consumer preferences. Lastly, Bangladesh should proactively engage with European countries that are embracing the "China plus one" policy to diversify their supply chains. By positioning itself as a dependable alternative source for apparel manufacturing, Bangladesh can secure a share of these expanding markets. This proactive stance will not only assist the RMG sector in mitigating preference erosion but also enable it to capitalise on the evolving dynamics of global trade.

In summary, Bangladesh's garment sector, a cornerstone of its economy, stands at a critical crossroads as it approaches LDC graduation. Our research, firmly grounded in microeconomic theory and comprehensive data analysis, offers invaluable insights for policymakers, industry stakeholders, and academics alike. As we collectively navigate the intricate challenges and promising opportunities ushered in by LDC graduation and tariff adjustments, we hope that this study contributes not solely to knowledge but also to the resilience and prosperity of Bangladesh's indispensable garment export sector in the swiftly evolving global trade landscape.

References

Ahmed, S. M., Hoque, M. N., & Talukder, M. S. (1993). Estimating Export Demand Function for Bangaldesh: An Application of Cointegration and Error Correction Modelling. *Bangladesh Development Studies, 21*(4), 89-104.

Bayes, A., Hossain, I., & Rahman, M. (1995). Trends in the External Sector: Trade and Aid. In R. Sobhan, *Experiences with Economic Reforms: A Review of Bangladesh's Development* (pp. 243-297). Dhaka, Bangladesh: University Press Limited.

Berman, N., Martin, P., & Mayer, T. (2012). How do different exporters react to exchange rate changes? *Quarterly Journal of Economics, 127*(1), 437-492.

Berry, S., Levinsohn, J., & Pakes, A. (1995). Automobile Prices in Market Equilibrium. *Econometrica, 63*(4), 841-890.

Boehm, C. E., Levchenko, A. A., & Pandalai, N. (2023). The Long and Short (Run) of Trade Elasticities. *American Economic Review, 113*(4), 861-905.

Caliendo, L., & Parro, F. (2015). Estimates of the Trade and Welfare Effects of NAFTA. *The Review of Economic Studies, 82*(1), 1-44.

Chamberlain, G. (1987). Asymptotic efficiency in estimation with conditional moment restriction. *Journal of Econometrics, 34*, 305-334.

Farrokhi, F., & Soderbery, A. (2020). *Trade elasticities in general equilibrium.* Working Paper.

Fitzgerald, D., & Haller, S. (2018). Exporters and shocks. *Journal of International Economics, 113*, 154-171.

Fontagné, L., Guimbard, H., & Orefice, G. (2022). Tariff-based product-level trade elasticities. *Journal of International Economics, 137*.

Fontagné, L., Martin, P., & Orefice, G. (2018). The international elasticity puzzle is worse than you think. *ournal of International Economics, 115*, 115-129.

Goldberg, P. K., & Pavcnik, N. (2016). The effects of trade policy. *Handbook of commercial policy, 1*, 161-206.

Hillberry, R., & Hummels, D. (2013). Trade elasticity parameters for a computable general equilibrium model. *Handbook of computable general equilibrium modeling*, 1213-1269.

Hossain, I., Rahman, A., & Rahman, M. (1996). Current External Sector Performance and Emerging Issues. In R. Sobhan, *Growth or Stagnation? A Review of Bangladesh's Development* (pp. 161-219). Dhaka, Bangladesh: University Press Limited.

Imbs, J., & Mejean, I. (2017). Trade elasticities. *Review of International Economics, 25*(2), 383-402.

McFadden, D. (1973). Conditional Logit Analysis of Qualitative Choice Behavior. In P. Zarembka, *Frontiers of Econometrics.* New York: Academic Press.

Panagariya, A., Shah, S., & Mishra, D. (2001). Demand elasticities in international trade: are they really low? *Journal of Development Economics, 64*(2), 313-342.

Rahman, M. Z., Sony, M., Hossen, M. S., Alam, M., & Liza, R. A. (2020). Steps toward smooth graduation of Bangladesh from least development countries. *Journal of Contemporary Research in Social Sciences, 2*(3), 57-67.

Rahman, M., & Bari, E. (2018). Pathways to Bangladesh's Graduation from LDC Group Prospects, Challenges and Sustainable Graduation Strategy. In D. Bhattacharya, *Bangladesh's Graduation from the Least Developed Countries Group: Pitfalls and promises.* Dhaka, Bangladesh.

Razzaque, M. A. (2004). The Small Country Assumption, Econometric Estimates and Policy Making: A Reassessment with Bangladesh's RMG Exports to the European Union. *The Bangladesh Development Studies*, 1-33.

Razzaque, M. A., Akib, H., & Rahman, J. (2020). Bangladesh's Graduation from the Group of LDCs: Potential Implications and Issues for the Private Secto. In *Navigating New Waters: Unleashing Bangladesh's Export Potential for Smooth LDC Graduation.* Dhaka, Bangladesh: Bangladesh Enterprise Institute (BEI).

Reynaert, M., & Verboven, F. (2014). Improving the performance of random coefficients demand models: The role of optimal instruments. *Journal of Econometrics, 179*, 83-98.

Shapiro, J. S. (2016). Trade costs, CO2, and the environment. *American Economic Journal: Economic Policy, 8*(4), 220-254.

Shilpi, F. (1990). *Estimating Income and Price Elasticities of Imports and Exports of Bangladesh.* Dhaka, Bangladesh: Bangladesh Institute of Development Studies.

Simonovska, I., & Waugh, M. E. (2014). The elasticity of trade: Estimates and evidence. *Journal of international Economics, 92*(1), 34-50.

Soderbery, A. (2018). Trade elasticities, heterogeneity, and optimal tariffs. *Journal of International Economics, 114*, 44-62.

Takashi, U., & Noriyoshi, F. (2021). Implications of Bangladesh's Graduation from Least Developed Countries Status on Japanese Companies. *Journal of Contemporary Research in Social Sciences, 3*(2), 28-39.

Tyazhelnikov, V., & Zhou, X. (2021). *PPML, Gravity, and Heterogeneous Trade Elasticities.* Working Paper.

UNCDP. (2019). *UNCDP. (2019). Ex ante Assessment of the Possible Impacts of the Graduation of Bangladesh from the Category of Least Developed Countries (LDCs).* Washington: UNCDP. (2019). Ex ante Assessment of the Possible Impacts of the Graduation of Bangladesh from the Category of Least DUnited Nations Department for Economic and Social Affairs. .

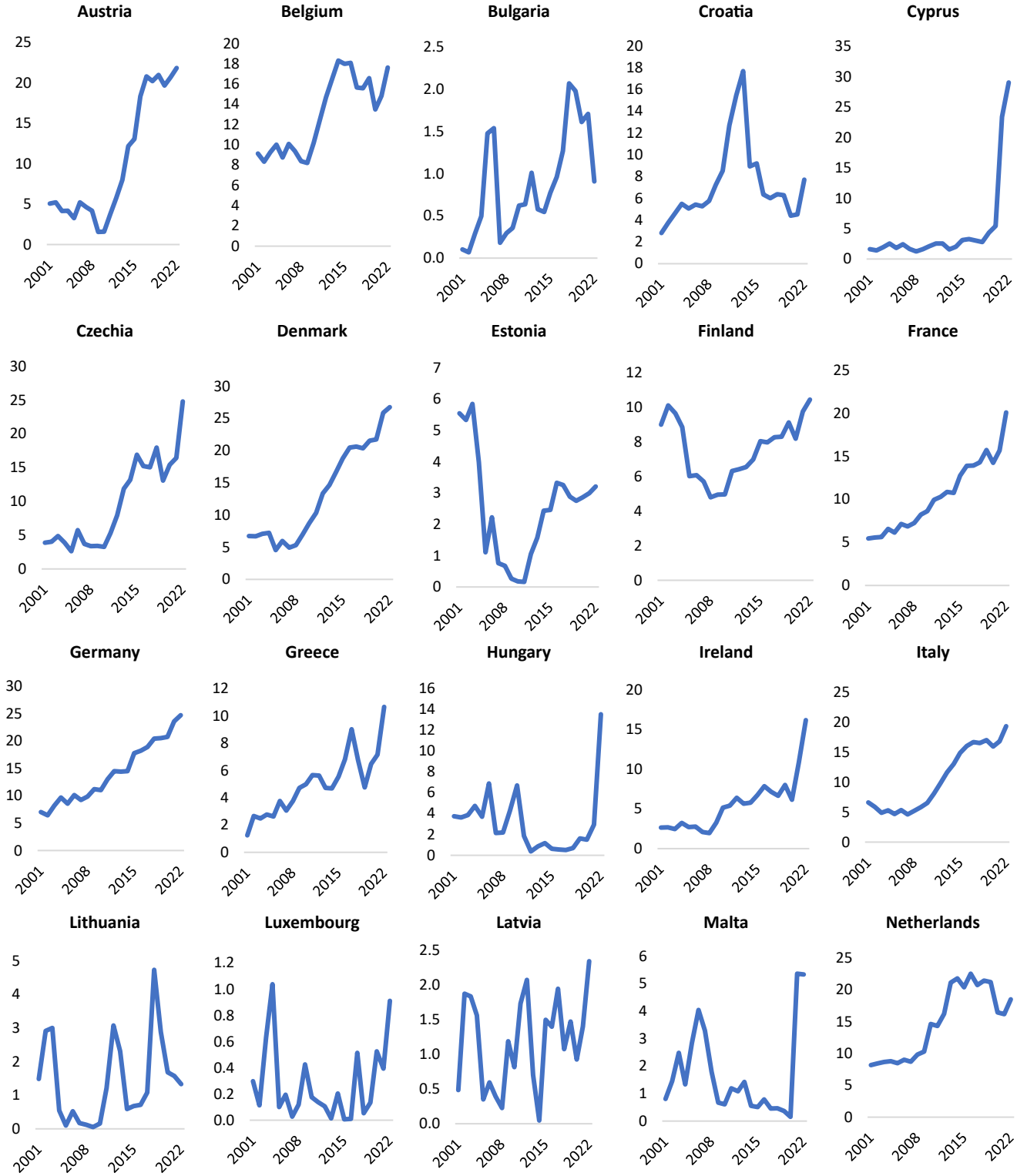
UNCTAD. (2016). *The Least Developed Countries Report.* Washington: The Least Developed Countries Report. United Nations Conference on United Nations Publications. Retrieved from https://unctad.org/en/PublicationsLibrary/ldc2016_en.pdf

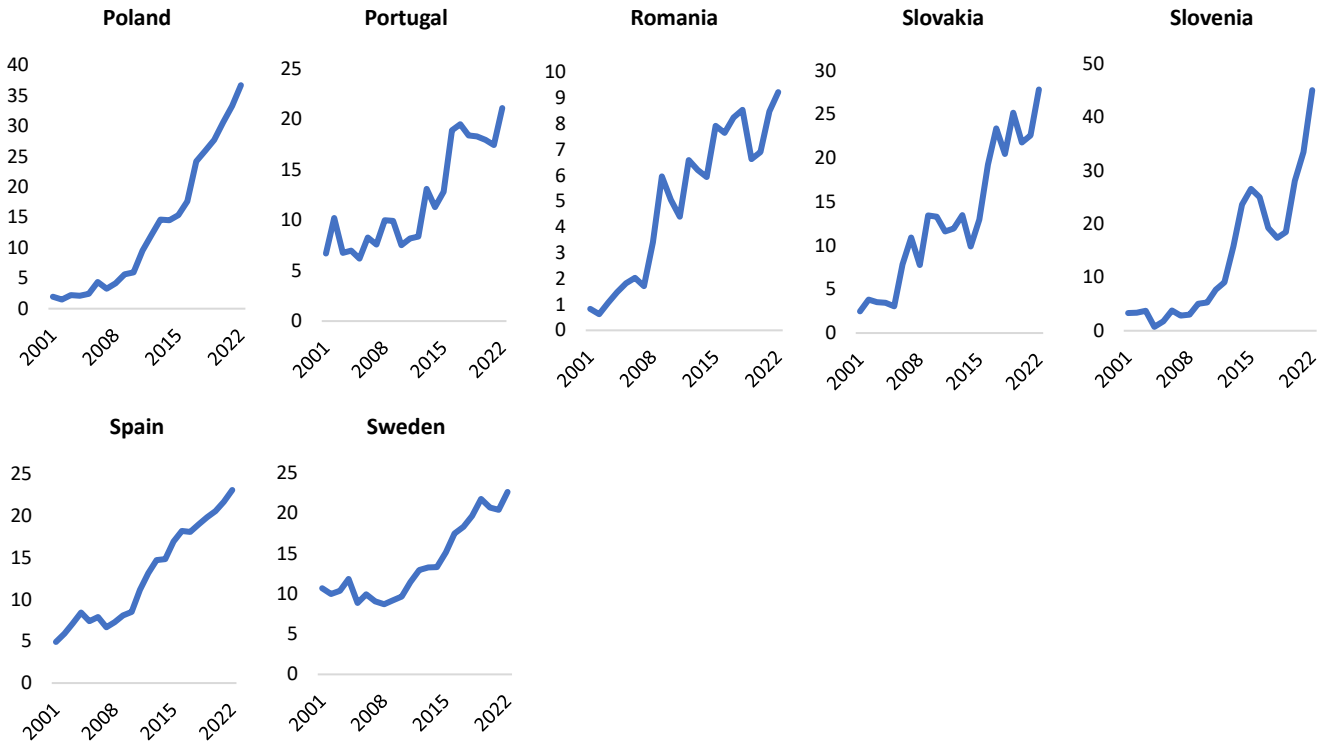
Vincent, D. W. (2015). The Berry–Levinsohn–Pakes estimator of the random-coefficients logit demand model. *The Stata Journal, 15*(3), 854-880.

WTO, & EIF. (2021). *Trade impacts of LDC graduation.* Geneva: World Trade Organization and Enhanced Integrated Framework.

Annex

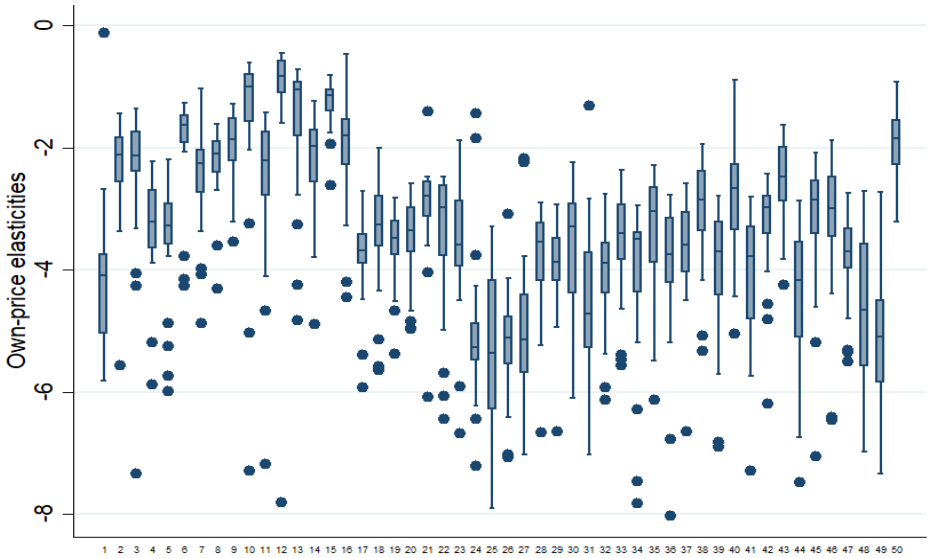
Figure A1: Bangladesh's share in individual EU country's apparel imports from non-EU countries (%)





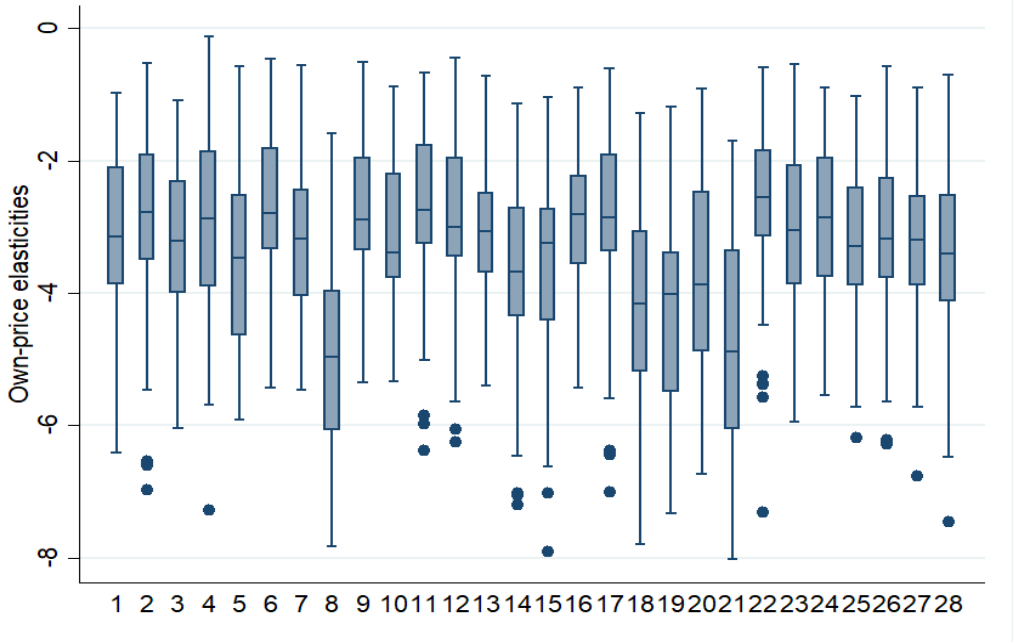
Source: Author's presentation using EU ComEXT data

Figure A2: Distribution of own-price elasticities for top 50 RMG products of Bangladesh in the EU and the



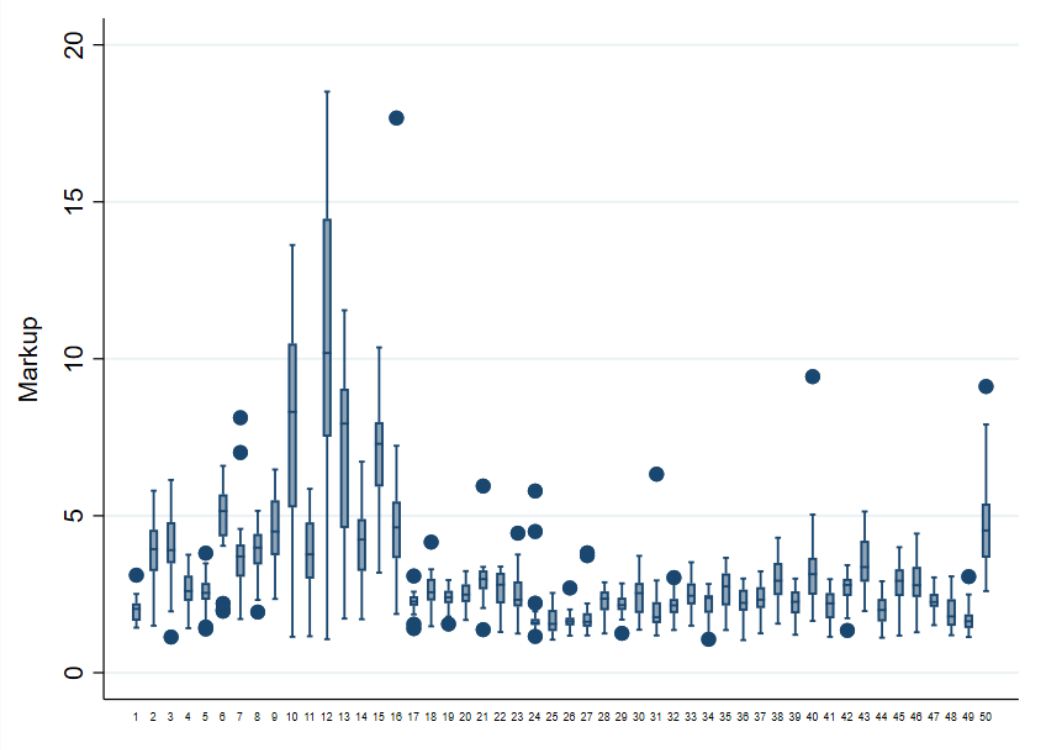
Source: Authors' estimation using EU ComEXT data

Figure A3: Distribution of own-price elasticities of Bangladesh's RMG products in the 28 EU markets.



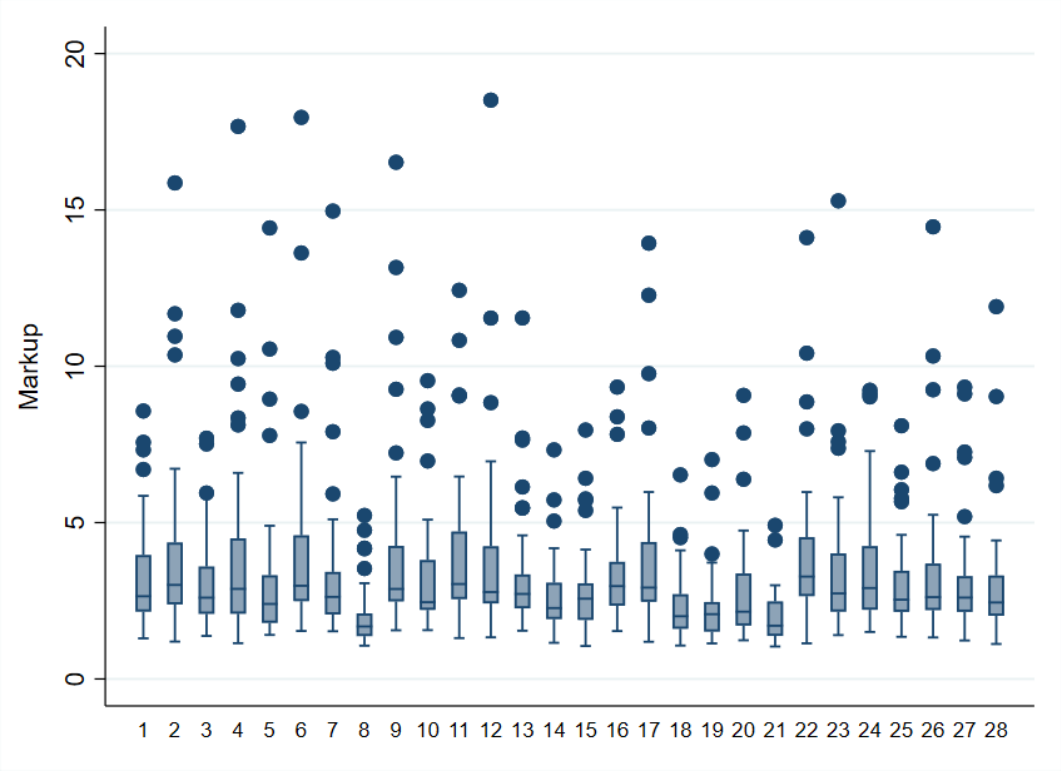
Source: Authors' estimation using EU ComEXT data

Figure A4: Distribution of markups for top 50 RMG products of Bangladesh in the EU and the UK



Source: Authors' estimation using EU ComEXT data

Figure A5: Distribution of markups of Bangladesh's RMG products in the 28 EU markets.



Source: Authors' estimation using EU ComEXT data

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