Developmental relevance of Everything but Arms: Implications for Bangladesh after LDC graduation

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Developmental relevance of Everything but Arms: Implications for Bangladesh after LDC graduation

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Abstract

Bangladesh is set to graduate from the least developed country status. Currently, Bangladesh benefits from preferential market access at zero tariffs to the European Union under the Everything but Arms scheme but its exports will no longer be eligible after graduation in 2026. Policy makers worry that the withdrawal of least developed country status may affect Bangladesh's position as a major exporter of ready-made garments to the European Union. This paper examines whether preferential market access for exports supported poverty reduction in Bangladesh. We test the relationship with a fixed-effects estimator and an instrumental variable approach. Results show that preferential access for exports reduced working poverty in Bangladesh. When we factor in World Governance Indicators and the Logistics Performance Index, results hold, as is the case when endogeneity and reverse causality between average years of schooling and the working poverty rate are accounted for. Finally, we find that female labour participation reduces the working poverty rate. Our findings suggest that Bangladesh's policymakers must focus on policies that foster governance and logistics, and build educational capacity for sustainable growth and poverty reduction.

Keywords: Trade policy; preference; least developed country; graduation

JEL classification: F13, F14, F16, O11

1. Introduction

As a least developed country (LDC) Bangladesh benefits from trade preferences that allow preferential access to its exports. The ready-made garment (RMG) sector has in particular benefitted from the non-reciprocal Everything but Arms (EBA) initiative of the European Union (EU) that allows market access at zero tariffs (European Commission, 2020; UNDESA, 2018). The sustained growth in RMG exports to the EU has resulted in strong gross domestic product (GDP) growth along with an improvement in the working poverty rate (WPR) in Bangladesh. For instance, the WPR declined from 21.5% in 2005 to 6.3% in 2018, and the GDP per capita increased from US$499.95 to US$1,827 during the same period. But

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Bangladesh's exports have become heavily concentrated in the RMG sector, and accounted for more than 90% of total exports by value in 2019 (OEC, 2021). As a result of robust economic growth Bangladesh reached the World Bank's threshold for lower middle-income country status in 2015, and scheduled to graduate from LDC status in 2024 (UN, 2021). However, due to the Covid-19 pandemic the transition period for graduation has been extended to 2026 (Centre for Policy Dialogue, 2021). Bangladesh will no longer be eligible for preferential market access into the EU under the EBA scheme three years after graduation. Since Bangladeshi exporters will face some tariffs, i.e. less generous market access than allowed under the EBA scheme. More than 92% of Bangladesh exports to the EU will face an average tariff rate of 8% to 9.9%, which is likely to create significant development related challenges for Bangladesh (Razzaque, 2018). In light of the dominance of the RMG sector in Bangladesh's export portfolio, a key concern for policymakers is how exporters will cope with the loss of zero tariffs (allowed by EBA preferences) and what would be the likely impact of loss of market access on development after graduation from LDC status in 2026.

This paper adds to the growing literature on the relationship between trade and development and examines whether EU trade policies are effective in poverty reduction in Bangladesh. In light of the growing debate on the role of trade in development[1] this paper firstly, examines the role of EU preferential market access to support development; and second, assesses whether the phenomenal growth of RMG and textiles exports impacted poverty reduction in Bangladesh, given the EBA scheme aimed to deliver a breakthrough in the economic development of the poorest countries. It is worth mentioning that tariffs under EBA scheme always remain at zero. Since the differential change comes from the volume of trade between Bangladesh and EU members, the analysis includes only importer effects and not year fixed-effects.

We use the WPR to test the link between preferential trade and development, where the WPR is the percentage of employed people living below US$1.90 per day threshold set by the World Bank. Data sources used include UN Comtrade for bilateral trade between the EU-28 (27 plus the UK) and Bangladesh for the period 2005–2018; the International Labour Organization (ILO) for the WPR; World Governance Indicators (WGI); World Development Indicators (WDI) that includes female participation; the Logistics Performance Index (LPI) also from the

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[1] See for example Furceri et al., 2018, 2020; McCaig, 2011; Naudé, Bosker, & Matthee, 2010; Hausmann, Hwang, & Rodrik, 2007 for detailed discussion.

World Bank; the United Nations Development Programme (UNDP) for average years of schooling; the ethnic fractionalization index is from Drazanova (2020).

This paper makes important contributions to the empirical literature. First, we assess the developmental impact of the zero tariffs EBA scheme and examine the relationship between strong export growth and working poverty using the case of the RMG and textiles sector. Second, we test the relationship with a fixed-effects (FE) estimator and an instrumental variable (IV) approach. We employ the FE estimator to control for unobserved heterogeneity from importing countries and include interactions between exogenous and endogenous variables to reduce the omitted variable bias problem. Using an IV approach, we address reverse causality between the WPR (dependent variable) and potential endogenous regressors. The main findings show that Duty-Free Quota-free (DFQF) access reduced the WPR in the RMG sector; in other words, the zero tariff policy impacted the WPR positively during the period 2005–2018. Governance indicators (rule of law, lower corruption, and regulatory quality) and the LPI also reduce the WPR, as does an additional year of schooling (the WPR decreased by 3.2 percentage points between 2005 and 2018, other things being equal). These results hold when female participation in the labour workforce is taken into account. We suggest that policymakers' efforts focus on policies that foster institutional governance and improved logistics, and which build educational capacity in Bangladesh.

The structure of this paper is as follows: Section 2 traces the links between preferential trade and sustainable development goals (SDGs). Section 3 presents the methodology and defines the variables. Section 4 presents stylized facts and discusses empirical findings. Section 5 concludes with implications for policymaking.

2. The mechanics of preferential trade and its link with SDGs

The 2030 Agenda for Sustainable Development recognizes that international trade is an important mechanism through which SDGs and targets can be achieved. While special and differential treatment (SDT) of developing countries has been a core element of the approach that has been historically pursued which continues to be prominent in the SDGs, the link between SDT and SDGs has not been established. SDGs focus on poverty alleviation, considers poverty as a multidimensional concept and has very often been measured by "deficiency in income" (Bedük, 2019). As Bochert et al. (2021) state "the EU often conditions preferential trade access to its market to the achievement of Non-Trade Policy Objectives (NTPOs) … such as sustainable development, human rights, and good governance". The Sustainable

Development Goals (SDGs), closely linked to NTPOs, require countries to halve poverty across all SDG dimensions by 2020. SDG 8 in particular aims to "promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all". As part of the SDGs, attention is growing on the need for economic growth and job creation as the foundation for sustainable development and poverty alleviation. As part of the growth agenda, deeper and more sustainable integration with global markets is an important tool, especially for the poorest countries. Studies acknowledge that trade is an engine for inclusive economic growth, lowers the prevalence of undernourishment and supports poverty reduction in developing countries. These also suggest that economic growth is the key to sustained poverty alleviation (see Dollar, 1992; Sachs & Warner, 1995; Winters & Masters, 2013; Winters & Martuscelli, 2014, Marson et al., 2022). During the 1990s, global cross-country studies argued that openness fostered economic growth (see, for example, Dollar, 1992; Sachs & Warner, 1995; Frankel & Romer, 1999).

The literature on trade preferences has grown in recent years.[2] For example, Frazer & Van Biesebroeck (2010) and Thelle et al. (2015) focus on a single scheme and use detailed product-level data to concur that preferences affect exports of developing countries positively. Preferential trade policies support development and increase economic growth in preference beneficiary countries (Gradeva & Martínez-Zarzoso, 2010), with several studies reporting a positive and robust relationship between economic growth, governance, and income levels (see Gerring et al., 2005; Persson & Tabellini, 2009; Khorana & Martínez-Zarzoso, 2019). Winters et al. (2004) suggest that trade liberalisation is likely to be more effective in conjunction with policies that permit investment, ensure stable macroeconomic conditions, and boost human capital. Studies observe that the rise in exports under the preferential framework coincided with higher labour demand (Robertson et al., 2009; Hanson, 2012; Lopez-Acevedo et al., 2016), and that higher employment has been associated with lowering poverty in beneficiary countries (Harrison, 2007).

The World Bank's measure of poverty, introduced in 1990 and now based on the average poverty thresholds of the 15 poorest countries, is still the dominant measure in development

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[2] Studies using bilateral country-level data that examine aggregate effect of non-reciprocal preference schemes report negative (Eicher & Henn, 2011; Herz & Wagner, 2011) and positive findings (Gil-Pareja et al., 2014; Ornelas & Ritel, 2020; Tobin & Busch, 2019). Both Ornelas and Ritel (2020) and Tobin and Busch (2019), however, find that WTO membership interacts with non-reciprocal preferences: the first study shows that the positive impact on exports vanishes with WTO membership, due to low preferences margins in a WTO context; the latter study finds that WTO membership reduces imports of beneficiaries. See Ornelas (2016) for a comprehensive review.

parlance. Originally set at US$1 per day, it was uprated to US$1.25 per day in 2005 and revised to US$1.90 per day in 2011 (Bray et al., 2020). The WTO (2018) has specifically recognized that trade contributes to the promotion of sustainable development both by the 2030 Agenda and its accompanying SDGs. The trade–growth nexus has been highlighted since the 1990s when economic growth in developing countries accelerated, leading to the narrowing of the income gap between developing and developed economies. Asia, in particular, has benefitted from trade as a result of countries adopting an export-oriented growth strategy which supported them to integrate into the world economy, reduce poverty, and improve human development indicators such as health and education (Hoekman, 2005). While the trade–growth nexus has weakened during the past decade, recent studies show that 1% growth in trade leads to an increase of 1% to 1.5% growth in GDP, raising income levels by 10 to 20 p.p. over a decade (Commonwealth Trade Review, 2021). Traditionally, trade policy debate has focused on the income channel, i.e. that openness to the international flow of goods and services can increase national income and hence support development. For example, Collier and Venables (2007) show that the benefits of trade preferences increase the export supply response, which in turn creates employment that reduces the WPR of beneficiary countries. Another channel shows that opening up to trade increases economic growth as it allows each country to use its resources more efficiently by specialising in the production of the goods and services that it produces competitively. In this manner, trade contributes to poverty reduction by establishing new employment opportunities and reducing the prices of goods and services (WTO, 2018). Literature provides evidence that trade growth through increased exports leads to an acceleration of economic growth (Hausmann et al., 2005; Patillo et al., 2005; Jones & Olken, 2008). Trade can be a powerful "enabler" of employment growth in developing countries as it also promotes greater competition and access to technology. Studies emphasise the impact of trade on specialisation (e.g. increased production of goods and services a country can make more efficiently), productivity growth, higher job creation rates, and economic growth (Hausmann, Hwang, & Rodrik, 2007; Naudé, Bosker, & Matthee, 2010; Furceri et al., 2018, 2020). For example, McCaig (2011) evaluates the effect of tariff increases on poverty and finds that lower tariffs reduce the headcount poverty ratio by 11% to 14% approximately. Furceri et al. (2018, 2020) analyse the effect of tariffs on unemployment and exchange rates with International Monetary Fund (IMF) and World Integrated Trade Solution (WITS) data, and report that tariffs lead to a small but marginally significant increase in unemployment via lower

labour productivity, defined as the ratio of GDP to employment, and an appreciation of the real exchange rate.

Studies analysing the impact of preferences report a positive impact on beneficiaries trade flows (Agostino et al., 2007; Hoekman et al., 2009; Frazer & Van Biesebroeck, 2010; Fugazza & Nicita, 2010; Cipollina & Salvatici, 2010; Cipollina et al., 2013; Gil-Pareja, et al. 2014; Cirera et al., 2016). Ito and Aoyagi (2019) analyse the impact of DFQF access for LDCs in Japan and found that Asian LDCs have benefitted from non-reciprocal preferences. Others quantify the gains from preferences in the range between US$300 million to US$400 million (Somwaru & Trueblood, 2002; Cernat et al., 2003; Yu & Jensen, 2005). A diametrically opposite approach is demonstrated by Özden and Reinhardt (2005) who argue that non-reciprocal preferences are a "Faustian bargain" with a negative global impact, since consumers pay higher prices for the imports or consume less. Cline (2004) offers an alternative viewpoint by suggesting that trade preferences have failed to act as the catalyst for economic development and structural diversification to the extent that the beneficiary countries had hoped for. Gradeva and Martínez-Zarzoso (2010) highlight that countries' eligibility for the EBA scheme alone does not guarantee an increase from LDC exports, which highlights that the debate on the nexus between trade and development is not new. Literature analysing the issue of Bangladesh's graduation lacks optimism on market access opportunities after it loses its LDC status. An UNCTAD (2016) study estimates that the reduction of exports could be in the range of 5% to 7%, although this fails to model EU-specific scenarios. Rahman and Bari (2018) estimate that Bangladesh would face an additional tariff of 6.7% after graduation, which would result in a possible export loss of US$2.7 billion, equivalent to 8.7% of Bangladesh's total exports in the period 2014–2015. The largest impact is estimated in the EU where preference erosion could mean an additional tariff of 8.7% for Bangladesh exports, which would have a detrimental impact on export earnings, industrial production, and employment. Razzaque et al. (2020) estimate that more than 92% of exports will face an average tariff rate of 8% to 9.9% in the EU market. Dawar et al. (2019) state that the impact is likely to be severe for the RMG sector (HS chapters 61, 62, and 63) as the product graduation threshold for these products is 47.2% below the standard generalised scheme of preferences (GSP, see Commission Delegated Regulation (EU) 2015/1978 dated 28 August 2015).

3. Data sources and methodological approach

3.1 Data sources

The databases used for the regression analysis include the following:

- Bilateral sectoral trade data from UN Comtrade (HS 4-digit level);
- EU-28 import tariffs from the Trade Analysis and Information System (TRAINS) database;
- Institutional WGI variables (regulatory quality, rule of law, control of corruption) from the World Bank WGI[3];
- Real income per capita (GDP pc), population growth rate and female labour participation rate from the World Development Indicators (WDI);
- Information on the number of days utilized to export, cost to export a container and documents required to export/import by Bangladesh from the LPI database;
- WPR from the International Labour Organization statistics – this is measured as the percentage of adults employed below US$1.90 purchasing power parity (2011 PPP)
- Average years of schooling[4] from UNDP;
- Proportion of people who profess the Muslim religion from the Composition of Religious and Ethnic Groups (CREG) project;
- Ethnic fractionalization index from Drazanova (2020).

Bilateral trade data for the period 2005–2018 are from UN Comtrade; WDI and WGI are for the period 2005–2018. The LPI has data for 2007, 2010, 2014, 2016, and 2018.

3.2 Indicators

World Governance Indicators

The WGI, constructed by Kaufmann et al. (2005) for the World Bank[5] has been employed by several studies (see Berden et al., 2014; Martínez-Zarzoso & Márquez-Ramos, 2019) which

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[3] World Governance Indicators include regulatory quality, rule of law, control of corruption, voice and accountability, political stability, and government effectiveness.

[4] Average years of schooling has been considered differently from other subcategories of the human asset index which are available as a three-year average. Since human capital variables are perfectly collinear, using additional variables is likely to weaken the statistical significance, which is why we use average years of schooling. The other categories of the human asset index include under-five mortality rate (U5M), maternal mortality ratio (MMR), prevalence of stunting (STU), gross secondary enrolment ratio (GSSE), adult literacy ratio (ALR), and the gender parity index for gross secondary school enrolment (GPIS).

[5] The six WGIs are based on 31 data sources that report the perceptions of survey respondents and assessments worldwide.

normalize the indicators on a 0–100 scale. The indicators used for this study represent the following dimensions of governance:

1. *Rule of law:* measures the extent to which agents have confidence in and abide by the rules of society, and emphasizes the quality of contract enforcement, police, and courts.

2. *Control of corruption:* measures the extent to which public power is not exercised for private gain; this includes all forms of corruption and the extent of "capture" by elites and private interests.

3. *Regulatory quality:* indicates the ability of governments to formulate and implement sound policies and regulations that promote private sector development.

Related literature confirms that institutions and exports directly affect the willingness of agents to trade and thereby impact economic variables that affect the agents' propensity to trade (Dort et al., 2014; Nun & Treffer, 2013). This suggests that an improvement in WGI in Bangladesh is likely to increase exports: in line with this we test whether an improvement in WGI and leads to higher economic growth, which in turn impacts the WPR and SDG 8 in Bangladesh.

Logistics Performance Index

The LPI lists information on a country's situation in terms of logistics and provides an indication of the problems it can face. Covering 160 countries (in LPI 2016), the index is constructed from over 5,000 country assessments compiled by more than 1,000 freight forwarders and logistics professionals worldwide. The respondents rate the logistics performance of their own country and eight other countries on a scale of 1 to 5. The LPI is published every two years and covers the following years: 2007, 2010, 2014, 2016, 2018. The 2007–2016 LPI report suggests that the gap between the "best" and the "worst" logistics performers is narrowing slowly, confirming that, although a country's level of development plays an important role, logistics performances and policies do matter. Studies show that improvements in logistics performance boost trade and competitiveness (see Bensassi et al., 2015), particularly in emerging economies (Martí & Puertas, 2017).

Working poverty rates and the link with years of schooling

The WPR is defined as the percentage of employed persons whose per capita income is below the threshold introduced above (i.e. US$1.90 per day in PPP terms). There is no data on the WPR for Bangladesh, hence we use ILO data with WPR estimates which are based on lower

and upper bounds econometric projections (Kapsos, 2005).[6] According to General Economic Division estimates for the 7th Five-Year Plan of Bangladesh, extreme poverty was estimated to be 8.9% in 2020. Our analysis presents a downward trend in the WPR from 21.5% (2005) to 6.3% (2018), suggesting that extreme poverty targets have been accomplished given the original target was 10.4% for 2018. The use of the WPR has two advantages over using survey information for analysis; first, the WPR can be updated; second, it provides a global perspective of the most vulnerable workers. Nonetheless, the WPR definition must be considered with caution as working conditions vary across countries. Expressed differently, a person's condition of poverty, who is living below US$1.90 per day, in one country cannot be compared to another individual in a different country in terms of the degree of deprivation (ILO, 2019). The literature documents an implicit link between education and poverty. Lind (2019) confirms that schooling (i.e. average number of years of education and the expected years that a child is willing to receive it throughout their life) is among the most important drivers of economic growth. Training, however, has a stronger effect on economic growth compared to schooling. Education is a self-selected investment by individuals who maximise its benefits by choosing the proportion of hours assigned to study and work. Workers' training is a complementary variable, and an important one, that improves cognitive skills and knowledge capital. Higher schooling rates (i.e. the number of years of education) coupled with a better quality of education accelerates economic development and better institutional quality (Hanushek & Woessman, 2020). Recent estimates by these authors suggest that the interaction between institutional quality and schooling, along with training skills, significantly improved in countries with higher trade openness compared to closed economies.

Bangladesh exports were growing steadily from 1970's until the Great Recession episode in 2008-2010 (Lopez-Acevedo et al. 2020). To control for the financial crash, a dummy variable equalling 1 has been created for the same period 2008–2010, being zero for the other years of the time span considered. The list of countries and the definition of variables are in the Supplementary Materials Appendix Tables 1 and 2, respectively.

Some caveats are worth mentioning. First, tariffs for some product lines were missing, which required an iterative process to ensure and assume that zero tariff benefits remain unchanged given an LDC's benefits do not change unless it has graduated from the preferential scheme.

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[6] The upper WPR bound is the total poverty rate times the employment rate while the lower bound is measured as the total poverty rate times (total) labour force.

Categorization has been undertaken by product because the likelihood of committing a statistical error of the second type is low (i.e. if the matching duty types are verified, then the probability of missing tariffs from other unmatched lines will be lower). If these rules do not meet the minimum requirements, the unmatched products are removed from the database. Second, we employ the WPR for Bangladesh, that is the percentage of employed adults living below US$1.90 in PPP terms, because the conventional poverty measures (e.g. headcount ratio and/or poverty gap) are either not available or are released in the form of surveys for a limited time span.

3.3 Methodological approach

This paper employs the ordinary least squares (OLS) model to test the following hypotheses:

H₁ₐ: Would graduation from the LDC category (i.e. loss of EBA preferences in RMG and textiles) lead to a negative outcome on the WPR after accounting for institutional indicators (rule of law, corruption, and regulatory quality) and average years of schooling?

H₁ʙ: Is graduation likely to lead to a negative impact on the WPR after accounting for the LPI? In line with Beverelli et al. (2018) our specifications control for observable and unobservable country-specific links between trade and national institutions by assuming the presence of exporter and importer fixed effects to a wide range of countries. In our sector-specific model (i.e. RMG), Bangladesh is the exporting country and the data is reported as time series. From the importer's (i.e. the EU member states) side, the data is in the form of a panel where the first dimension is given by the grouping of products and importing countries, and the second dimension is time expressed in years. Furthermore, the standard errors are clustered at the HS 4-digit level product to mitigate the correlation between residuals to avoid biased coefficient estimates.[7] Thus, we reduce the omitted variable bias while preserving the standard inference tools with simple OLS techniques.

The model in basic form is estimated with the following equation:

$$y_t = \beta_1 lexp + \beta_2 ltariff + PRF_t + \beta_3 popgr + \beta_4 avsch + Crisis_t + \beta_5 rlaw + \beta_6 corr + \beta_7 rqe + f_i + \epsilon_t \tag{1}$$

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[7] A least square dummy variable (LSDV) technique (see Bruno, 2005) cannot be applied when an unbalanced panel is used. The source of variability here is not attributed to time but due to the fact that the importing EU countries and some products (between EU members and Bangladesh) are not traded in all years. The EBA scheme allows preferential market access to RMG and textile products at zero tariffs, i.e. tariffs remain unchanged over time. Therefore, variability comes from changes in the volume of exports.

Where:

y_t is the working poverty rate (WPR);

$lexp$ is the natural log of Bangladeshi exports in RMG to the EU;

$ltariff$ is the natural log of simple average of tariffs;

PRF is the tariff dummy (GSP or PRF);

$popgr$ is the population growth rate;

$avsch$ is the average number of schooling years;

$Crisis$ is the dummy for the 2008–2010 recession;

$rlaw$ is the score for rule of law;

$corr$ is the score for corruption;

rqe is the score for regulatory quality.

Subscript t is reported for dummy variables, f_i for importer-fixed effects and the error term is ϵ_t.

$$y_t = \beta_1 lexp + \beta_2 ltariff + PRF_t + Crisis_t + \beta_3 lpi + \beta_4 rqe + f_i + \epsilon_t \qquad (2)$$

Where pi is the Logistics Performance Index

As evident from equation (2) we reduce the number of regressors since lpi has data for five years only. In this case, increasing the number of covariates increases the fit of the model with R-squared reaching one, which is a sign of perfect multicollinearity.

For robustness checks we interact the institutional controls with preferential market access under the EBA scheme since, as an LDC, Bangladesh is a beneficiary of the scheme.[8] We use a dummy for zero tariffs under the EBA scheme (PRF = 1) and (GSP = 0) for the GSP[9] with the following controls: population growth, average schooling years, a dummy crisis (2008–2010 recession = 1), WGI (rule of law, corruption, and regulatory quality), exports, and tariffs. We also address potential endogeneity of schooling with two exogenous instruments, namely the proportion of population based on religion and the ethnic fractionalization index.

4. Discussion of the results

4.1 Stylized facts: The impact of the EBA scheme on Bangladesh

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[8] A host of studies examine preferential market access; see, for example, Iwanon and Kirkpatric (2007), Martínez-Zarzoso and Marquez-Ramos (2008), Aiello and Cardamone (2011).

[9] According to TRAINS the notation for the GSP is the Most Favoured Nation (MFN) tariff. This paper follows these notations.

Table 1 shows that the log of per capita average income is 8.128, which corresponds to US$3,388 in 2017 PPP terms during 2005-2018. Bangladesh achieved its highest per capita income (US$4,441) in 2018; this is attributed to higher RMG exports which doubled in market share between 1995 and 2012. The RMG sector has been a key contributor, with a share of total exports accounting for over 80% in the financial year 2014/15, and Bangladesh is now the second-largest exporter of RMG in the world (World Bank, 2016).

Table 1: Summary statistics: Bangladesh 2005-2018

	Mean	SD	Min	Max
(log of) Exports (RMG + textiles)	12.590	3.126	5.583	20.300
(log of) GDP per capita (US$ PPP in 2017)	8.128	0.203	7.839	8.399
Working poverty rate (% employed living below 1.90 US$ PPP)	13.090	4.142	6.280	18.460
Schooling (average years)	5.441	0.502	4.700	6.100
GSP tariff	5.121	5.443	0.000	12.000
Population growth rate	1.127	0.059	1.050	1.227
Rule of law	-0.742	0.076	-0.827	-0.640
Corruption	-0.953	0.087	-1.057	-0.857
Regulatory quality	-0.872	0.059	-0.946	-0.797
Logistics performance index	2.603	0.092	2.470	2.740

Source: Author's calculations.

We hypothesize that preferential market access improves welfare and reduces the WPR in line with SDGs 8.2 and 8.3. We assume that tariffs would have an adverse impact on the WPR. We control for Bangladesh's exports and present the relationship in Figure A1 and A2 (see Supplementary Materials Appendix 1). Higher trade goes hand-in-hand with economic growth as noted from cross-country evidence (see Dollar & Kraay, 2004). The authors conclude that the average real income growth in Bangladesh was 3.1% between 1989 and 1996, and that inequality given by the Gini coefficient increased from 28.9 in 1989 to 33.6 in 1996 while the poorest quintile remained at 1.8 in 1996. In our case, we infer that higher trade volumes under the EBA scheme coupled with better institutional quality improved well being in Bangladesh's measured in terms of the WPR (i.e. reduced the number of people living in absolute poverty).[10] The institutional indicators (rule of law, corruption, and regulatory quality) show that there is an average improvement for rule of law and corruption of 34% and for regulatory quality of 22% over the period 2005–2018. There is also an improvement in the LPI score, from 2.47 in 2007 to 2.58 in 2018, evidenced by lower waiting times and fewer documents required to export/import. This reinforces the link between the ease of doing business and higher exports.

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[10] Results are reported in Table A3 of Supplementary material.

Similarly, average years of schooling for Bangladesh improved from 4.5 in 2005 to 6.1 in 2018 (an average of 5.4 over the period 2005–2018). The WPR (a priori) is a standard indicator similar to other measures of poverty which include the headcount ratio and/or the poverty gap, but data on the latter measures are not available for Bangladesh. Lastly, the average LPI, which consists of six indicators for five years, is 2.512 (see Supplementary Materials Appendix Table 2). The issue is whether higher exports of RMG by Bangladesh have an impact on WPR.

4.2 OLS results

H_{1A}: Would graduation from the LDC category (i.e. loss of EBA preferences in RMG and textiles) lead to a negative outcome on the WPR after accounting for institutional indicators (rule of law, corruption, and regulatory quality) and average years of schooling?

Table 2 reports results on the impact of the EBA scheme on both RMG, and RMG and textiles (equations 1 and 2). In columns 1 and 6, the results do not include controls and the EBA scheme. An increase of simple average tariffs is positively related with the WPR such that a 1% tariff increase leads to a 0.379% and 0.229% increase in the WPR respectively, other things being equal.[11] In other words, had zero tariffs not been allowed to Bangladesh under the EBA scheme, the WPR would be higher. These results confirm the findings by Dollar and Kraay (2004) that lower (higher) tariffs foster (hamper) trade, the results confirm this for Bangladesh's exports, and show a reduction (increase) in poverty.

Column (2) incorporates the population growth rate in Bangladesh. Results indicate that the coefficients are positive and statistically significant for the WPR; however, the coefficient of tariff point decreases by more than double (from 0.379% to 0.143%) when the population growth coefficient (which is positive) is included.

Column (3) includes three additional controls: duty type, average years of schooling, and financial crisis dummies. The first dummy, duty type (i.e. zero preferential tariff on RMG), has a small positive coefficient (i.e. tariffs increase the WPR by 0.326%) and is statistically significant.

Conversely, the simple tariff coefficient is significant and has the expected sign, although the coefficient is 0.031% (ten times lower than the preferential tariff, 0.003%). With regard to

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[11] The coefficients are calculated in a classical log-linear model, i.e. point estimates are divided by 100. In this case, the dependent variable is already expressed in percentage.

education, an additional year of schooling results in decreased poverty by 3.158%. The second dummy, the financial crisis, is positive and poverty increased by 2.172% points during that two-year period in Bangladesh. It is worth stressing that the population growth effect diminishes by 10% on average when compared to column (2).

Column (4) includes all control variables. The coefficient of tariffs, duty type dummy, and average schooling years remains almost unchanged when compared to column (3). The result of population growth on the WPR is lower by 11.5% (from 19.1% to 7.6%) and the financial crash dummy is slightly lower (1.6%, down from 2.172%). The inclusion of institutional controls (rule of law and corruption) is highly significant for reducing the WPR along the lines of SDG 8. For example, a one-point increase in the rule of law score reduces the WPR by more than 10% points for Bangladesh. Similarly, a 1% point increase in the corruption score reduces the WPR by more than 2.5% points. In the case of RMG and textiles (columns 7, 8 and 9), coefficients are similar and continue to be statistically significant.

H_{1B}: Is graduation likely to lead to a negative impact on the WPR after accounting for the LPI?

Table 2 presents a different picture for RMG when the LPI is introduced in column 5. An improvement of 1% point in the LPI decreases the WPR by 3.68% points. Moreover, a 1% increase of simple tariff on RMG increases the WPR by 0.12%, in case where the PFR dummy is not equal to 1 (i.e. GSP) an increase in tariff would increase the WPR by 1.15% point. The results show that the potential negative impact of an increase in tariffs is offset if the LPI score is higher (e.g. required documents and days to export/import are lower). Furthermore, the 2008–2010 financial crisis increased the WPR in Bangladesh by more than 5% points. Finally, a 1% increase in regulatory quality decreases the WPR by more than 40%.

Interestingly, in RMG and Textiles (column 10), the LPI coefficient doubles (from 3.68% to 6.98% decrease in the WPR) due to a combination of sectoral and macroeconomic data (124 lines of products on average versus 46 in RMG). The explanation for this is that the current regulatory framework subsidizes exporters by 10% which, due to the single transformation RoO, further fostered private sector participation leading to higher RMG exports to the EU. In other words, RMG exports are more elastic than RMG+Textiles because RMG use preferences.

Table 2: Working Poverty Rate and the EBA scheme (RMG): Bangladesh 2005-2018

Variables	(1) RMG	(2) RMG	(3) RMG	(4) RMG	(5) RMG	(1) RMG+Textiles	(2) RMG+Textiles	(3) RMG+Textiles	(4) RMG+Textiles	(5) RMG+Textiles
(log of) Exports	-0.396***	-0.153***	-0.044***	-0.036***	-0.170***	-0.295***	-0.104***	-0.029***	-0.024***	-0.107***
	[0.067]	[0.029]	[0.008]	[0.007]	[0.030]	[0.055]	[0.025]	[0.006]	[0.005]	[0.022]
(log of) Simple tariff	37.976***	14.310***	3.126***	3.121***	12.077**	22.934***	7.587**	1.498**	2.003***	5.510**
	[11.241]	[3.684]	[1.132]	[0.940]	[4.922]	[7.181]	[3.145]	[0.645]	[0.520]	[2.365]
PRF tariff+			0.326***	0.300***	1.154**			0.162**	0.191***	0.446*
			[0.110]	[0.092]	[0.511]			[0.063]	[0.049]	[0.235]
Population growth rate		29.242***	19.135***	7.620***			29.388***	18.791***	6.875***	
		[0.460]	[0.322]	[0.441]			[0.419]	[0.277]	[0.407]	
Schooling (average years)			-3.158***	-3.161***				-3.196***	-3.203***	
			[0.053]	[0.046]				[0.047]	[0.041]	
Sub-prime crisis+			2.172***	1.602***	5.521***			2.135***	1.533***	6.082***
			[0.036]	[0.043]	[0.202]			[0.035]	[0.042]	[0.216]
Rule of law				-10.179***					-10.350***	
				[0.165]					[0.152]	
Corruption				-2.627***					-2.879***	
				[0.220]					[0.198]	
Logistic performance index					-3.680**					-6.983***
					[1.561]					[1.556]
Regulatory quality					-40.408***					-39.131***
					[1.692]					[1.541]
Observations	3,158	3,158	6,171	6,171	2,212	3,800	3,800	7,805	7,805	2,763
Lines of products	45	46	46	46	46	102	102	128	128	114
R-squared (within)	0.055	0.647	0.883	0.901	0.546	0.032	0.643	0.883	0.902	0.552
Importer Fixed-Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
EBA Scheme Zero Tariff	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: + Indicates that the variable is a dummy: PRF; equal to 1 for the EBA scheme, 0 for GSP. Sub-prime crisis; equal 1 for the financial crisis period (2008-10), 0 in the other years. Robust standard errors in brackets clustered at HS 4-digit product level. *** p<0.01, ** p<0.05, * p<0.1. Source: Author's calculations

In light of our findings the following methodological issues are worth stressing. First, higher WGI coefficients are explained by higher correlation between regressors (potential multicollinearity) especially when the LPI is included. Second, variables might be (partially) correlated with the unexplained component of the error term in all models, so the potential endogeneity of WGI is likely to undermine the results. Finally, some omitted variables may impact on average years of schooling and lead to reverse causality between the WPR and education, rather than the other way around, which we address below.

4.3 Robustness checks

4.3.1 Endogeneity

Studies show that potential endogeneity of a covariate can be addressed by building an interaction term between the endogenous and exogenous binary variable (see Beverelli et al., 2018; Dreher et al., 2017; Nizalova & Murtazashvili, 2016). We construct an interaction term between potentially endogenous regressors (with rule of law, corruption, regulatory quality, and the LPI) and a simple tariff covariate which confirms the complementary indirect effect of tariffs on exports and institutions. The treatment variable is duty type dummy (i.e. PRF) that is nested in tariff type which is exogenous. We exclude exogenous treatment (simple tariff) and endogenous regressors (rule of law, corruption, and the LPI) from the specifications to avoid multicollinearity.[12]

Table 3 presents results for RMG, and RMG and textiles. The majority of the interaction terms in both sectors are statistically significant with the expected signs. For example, when the average simple tariff is interacted with rule of law, the WPR decreases by 13.4% for RMG and by 6.62% for RMG and textiles (columns 1 and 4, respectively). LPI interactions show a 25% decrease in the WPR for RMG (column 3), while for RMG and textiles there is a reduction of 9% in the WPR (column 6). Conversely, when the average simple tariff is interacted with corruption, point estimates are considerably lower. For example, for RMG (column 2) the WPR decreases by 0.733% and 0.967% for RMG and textiles (column 5) although none of these are statistically significant.

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[12] The rationale for the statistical approach is that the exogenous component of the interactions (simple tariff) reduces the higher correlation of potential endogenous variable and the WPR. Therefore, the interactions will also be weakly correlated with the WPR. We apply this same reasoning to build a double interaction between the treatment variable, regulatory quality, and the LPI. The results of pairwise correlations are available on request.

Table 3: Robustness check
Working Poverty Rate under EBA (RMG, RMG and Textiles): Bangladesh 2005-2018

VARIABLES	(1) RMG	(2) RMG	(3) RMG	(4) RMG+Textiles	(5) RMG+Textiles	(6) RMG+Textiles
(log of) Exports	-0.057***	-0.040***	-0.380***	-0.038***	-0.028***	-0.256***
	[0.009]	[0.008]	[0.054]	[0.007]	[0.006]	[0.040]
PRF tariff+	1.095***	0.078	6.085***	0.508***	0.113*	2.088***
	[0.238]	[0.088]	[1.627]	[0.092]	[0.066]	[0.491]
Population growth rate	18.571***	19.087***		18.553***	18.731***	
	[0.340]	[0.327]		[0.267]	[0.283]	
Schooling (average years)	-3.154***	-3.159***		-3.193***	-3.194***	
	[0.052]	[0.054]		[0.046]	[0.047]	
Sub-prime crisis+	2.146***	2.170***	3.479***	2.125***	2.130***	3.568***
	[0.035]	[0.037]	[0.117]	[0.034]	[0.035]	[0.098]
(log of) Simple tariff × Rule of law	-13.391***			-6.622***		
	[2.749]			[1.176]		
(log of) Simple tariff × Corruption		-0.733			-0.967	
		[0.812]			[0.593]	
(log of) Simple tariff × Logistic performance index × Regulatory quality			-25.361***			-9.118***
			[6.538]			[2.219]
Observations	6,171	6,171	2,212	7,805	7,805	2,763
Lines of products	46	46	46	128	128	114
R-squared (within)	0.885	0.883	0.205	0.884	0.883	0.165
Wald test interactions (p-value)	(0.000)	(0.371)	(0.000)	(0.000)	(0.106)	(0.000)
Importer Fixed-Effects	Yes	Yes	Yes	Yes	Yes	Yes
EBA Scheme Zero Tariff	Yes	Yes	Yes	Yes	Yes	Yes

Notes: + Indicates that the variable is a dummy: PRF; equal to 1 for the EBA scheme, 0 for GSP. Sub-prime crisis; equal 1 for the financial crisis period (2008-10), 0 in the other years. Robust standard errors in brackets clustered at HS 4-digit product level. *** $p<0.01$, ** $p<0.05$, * $p<0.1$. Source: Author's calculations.

The other regressors for both sectors have the expected signs and are statistically significant. It is important to note that the robustness checks do not include population growth rate and average years of schooling as regressors for equation (2) because (a) the LPI data is available for only five years; and (b) Variance Inflation Factor (VIF) and the R-square would be significantly higher. Along these lines, lower standard errors of the estimated coefficients and the Wald tests for the interactions confirm the robustness of results. Thus, the "statistical" approach to deal with potential endogeneity of covariates confirms the findings reported in Table 2. Thus, our methodology represents a powerful alternative to the traditional instrumental variable (IV) approach, which is challenging to employ when there is only one exporting country and several importing countries.

4.3.2 Reverse causality between average years of schooling and the WPR

The specifications in equations (1) and (2) can suffer from reverse causality, and it is intuitive that not only education boosts labour participation[13] and reduces the WPR but that the reverse directional link can also apply, that is reduced WPR increases income, which can impact (improve) educational attainment and lead to higher average years of schooling. To address this, we implement an instrumentation of mean schooling years by using two exogenous external variables:

   a) the proportion of population by religion (Muslim) in Bangladesh by drawing on studies where religion variables are used as instruments (see Barro & McCleary, 2003; Guiso et al., 2003; Chen & Hungerman, 2014; Bhalotra et al., 2014). For example, Bhalotra et al. (2014) identify "exogenous variation" in Muslim representation and find that religious identity can have important consequences for development. Öhlman (2021) uses the so-called "centrality of Religiosity Scale" to investigate the effect of religion on labour market performance.
   b) the historical index of ethnic fractionalization constructed by Drazanova (2020). The ethnic fractionalization index originally proposed by Easterley and Levine (1997), and

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[13] Earlier studies on Bangladesh report that since 1990 economic growth acceleration, education and female labour force participation have been increasing in tandem (Rahman & Islam, 2013). In the case of RMG, studies suggest that growing up in a village within a commutable distance of a garment factory increases the probability (by 13% compared to women who do not have average years of schooling) of women working outside their home in any sector, and that the effect of higher participation in the labour force is stronger for young women who had completed secondary school (Heath & Mobarak, 2015).

subsequently developed by Alesina (2003), has been used by Dreher and Langlotz (2020). Earlier studies used the fractionalization index of a society either as a direct regressor (i.e. another independent variable) or as an indirect regressor through interactions. Dreher and Langlotz (2020) argue that fractionalization is a powerful instrument because it leads to higher government budgets, which lead to an increase in a country's aid budget. Regardless of the budget allocation in Bangladesh, the probability that two randomly selected people will not belong to the same ethnolinguistic group is low, and hence the ethnic fractionalization index is considered an instrument for our equation.

The choice of both instruments meets the well-known rk-LM test, and the over-identification restriction test by the Hansen j-test is not rejected in almost all specifications. Where it is rejected, we construct robust confidence sets to assess the validity of the above-mentioned instruments for our model. Furthermore, to reduce statistical noise we smooth possible changes in the sign and magnitude of the sub-prime crisis dummy by introducing the labour force participation rate, given female labour participation is particularly strong in Bangladesh's RMG and textiles sector (World Bank, 2019, p. 58). The reason to introduce this variable in into the analysis is given by the high collinearity with WGI. The results for the instrumentation of the years of schooling which present the complementary effect of tariffs on exports are in Table 4. The instrumented education variable (i.e. average years of schooling) has the expected negative sign and is statistically significant for all specifications irrespective of exogenous regressors used (first row of columns 1–6).

As expected, the inclusion of female labour participation reduces the WPR (see columns 2 and 5). However, if we disregard female labour participation the coefficients of schooling are higher (columns 1, 3, 4, and 6). Conversely, when we control for female labour participation the IV estimates for average years of schooling for RMG and RMG and textiles are higher compared to those from OLS. The explanation for such divergence could be explained by weak instruments and/or heterogenous effects as a result of zero tariffs.

Table 4: Robustness check: IV Estimates
Working Poverty Rate under EBA (RMG, RMG and Textiles): Bangladesh 2005-2018

VARIABLES	(1) RMG	(2) RMG	(3) RMG	(4) RMG+Textiles	(5) RMG+Textiles	(6) RMG+Textiles
Schooling (average years)	-4.661***	-2.888***	-4.629***	-4.649***	-2.729***	-4.615***
	[0.052]	[0.188]	[0.051]	[0.045]	[0.166]	[0.044]
(log of) Exports	-0.000	-0.001	-0.001	0.001	0.001	0.001
	[0.004]	[0.003]	[0.004]	[0.003]	[0.002]	[0.003]
PRF tariff+	0.131*	0.099*	0.139*	0.080*	0.052*	0.082*
	[0.075]	[0.050]	[0.075]	[0.043]	[0.029]	[0.042]
(log of) Simple tariff	1.390*	1.050**	1.468**	0.833*	0.578**	0.857**
	[0.712]	[0.472]	[0.711]	[0.431]	[0.287]	[0.429]
Population growth rate	5.260***	6.285***	5.380***	5.364***	6.477***	5.495***
	[0.179]	[0.200]	[0.174]	[0.152]	[0.171]	[0.147]
Sub-prime crisis+	-0.415***	-0.047		-0.391***	0.005	
	[0.035]	[0.053]		[0.030]	[0.046]	
Labour participation force rate (female)		-0.481***			-0.520***	
		[0.045]			[0.040]	
Labour participation force rate (female) × Sub-prime crisis			-0.013***			-0.012***
			[0.001]			[0.001]
Observations	3,894	3,894	3,894	5,036	5,036	5,036
Lines of products	46	46	46	127	127	127
R-squared (uncentered)	0.901	0.961	0.902	0.902	0.965	0.903
Under identification test rk LM (p-value)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Hansen test (p-value)	(0.622)	(0.011)	(0.777)	(0.812)	(0.001)	(0.547)
Weak iv two-step test (md2s intervals)	-	[-3.249, -2.529]	-	-	[-3.014, -2.548]	-
Endogeneity test (p-value)	(0.000)	(0.014)	(0.000)	(0.000)	(0.014)	(0.000)
Importer Fixed-Effects	Yes	Yes	Yes	Yes	Yes	Yes
EBA Scheme Zero Tariff	Yes	Yes	Yes	Yes	Yes	Yes

Notes: The instrumented variable is the average years of schooling. Rejection of the endogeneity test shows that IV methods are meaningful. + Indicates that the variable is a dummy: PRF; equal to 1 for the EBA scheme, 0 for GSP. Sub-prime crisis; equal 1 for the financial crisis period (2008-10), 0 in the other years. To allow for more efficient estimation when the model is overidentified (i.e. more instruments than endogenous regressors), we perform a GMM estimation. We employ the LC minimum-distance estimator for efficient matrix with a coverage distortion of 5%, 95% confidence level and 500 grid points to form a two-step identification-robust confidence set because it is heteroskedasticity-robust and yields more powerful results when weak identification arises. The constructed interval results in a cut-off distortion rate of 15% (RMG) and 7% (RMG+Textiles). Robust standard errors in brackets clustered at HS 4-digit product level. *** p<0.01, ** p<0.05, * p<0.1. Source: Author's calculations.

The other tariff-related variables (PRF, simple tariffs) show lower statistical significance with the expected signs. Another point worth highlighting is the inverted sign of the sub-prime crisis dummy variable (columns 1 and 4) and, as already mentioned (see footnote 14), we explain that this negative sign with an increase in female labour force participation is fostered even more during a crisis. This is confirmed by a negative sign for the female labour force participation rate (columns 2 and 5) while the sub-prime crisis dummy becomes statistically insignificant, but the interaction term between crisis and female labour force participation is statistically significant, negative, and lower in magnitude (columns 3 and 6).

Last but not least, to test the validity of the two aforementioned instruments, the Hansen-j test is employed. Only for columns 2 and 5 is the Hansen test rejected. To address this, we first implement a two-step identification-robust confidence test (Sun 2018). Results show that the coefficients of the years of schooling are within the boundaries of 95% confidence set and the performance of the selected instruments is acceptable. In addition, following Oster (2019) we run a placebo test to compare the bias between OLS and IV estimates in cases where rejection of the Hansen test takes place. Results (see Supplementary Materials Appendix Table 4) indicate that IV estimates for RMG are slightly overestimated while for RMG and textiles these are slightly underestimated. Therefore, we conclude that such difference lies within the cut-off distortion rate as our robust confidence intervals test have confirmed. Finally, we assess the validity of OLS estimates in the presence of heterogenous treatment effects due to zero tariffs in treated products (RMG, RMG and textiles) and untreated ones (counterfactual).[14] Appendix Table 5 (see Supplementary Materials) suggest that the difference between the OLS coefficient and average treatment effect (ATE) is equal to 57.7–69.4% of the difference between the average treatment of untreated (ATU) and the average treatment of treated (ATT). These differences are quite significative for RMG exports. In the case of OLS and ATT, the difference narrows to 13.1–20.0%. However, ATT estimates display a negative sign. For these reasons, the use of OLS methods would be a pessimistic scenario as it disregards reverse causality links between schooling and WPR; thus, increasing the bias and heterogeneity among other regressors.

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[14] Given that the EBA scheme is a supranational agreement which grants preferential access to a particular group of products, an ignorability assumption and conditional independence might be plausible in spite of the absence of parallel trends which in general is untestable.

5. Conclusion and policy implications

This paper examines whether preferential zero tariffs under the EBA scheme reduced WPR's in Bangladesh during 2005 and 2018 period. Results suggest that RMG exports benefit from preferential access to the EU market, which in turn suggests that the impending graduation of Bangladesh could impact SDG 8. From a macroeconomic perspective, our findings suggest that tariffs under the EBA on RMG-Textiles exports are negatively related with the WPR. Furthermore, higher governance and institutional quality (rule of law, low corruption, regulatory quality) and less onerous LPI reduce the WPR, and lower trade costs. For instance, a 1% increase in the rule of law score reduces the WPR by more than 10% while a 1% improvement in the corruption score reduces the WPR by 2.5%. Similarly, a 1% increase in the LPI score reduces the WPR by 5.33%. Results show that the rule of law and control of corruption affect export performance via tariffs, which is in line with existing literature (see Kaufmann, 2008). The interaction between tariffs and institutional variables and/or LPI impacts RMG exports positively. When endogeneity of WGI and likely reverse causality between the WPR and average years of schooling are accounted for, results hold. A higher female labour force participation rate also reduces the WPR.

The paper has two main policy related findings. First, Bangladesh's preparation for graduation relying only on sustainable economic and export growth is not sufficient to ensure a smooth transition. Investments must be focused on productive capacity development, health and social protection systems, and digital connectivity as these complements those in physical infrastructure (e.g. rural roads). In terms of working conditions, building a productive sustainable capacity that promotes economic gender diversity can be a powerful tool to achieve SDG 8. These processes can reinforce each other by recognizing employment creation and spatial development coupled with institutional internal policies as explicit objectives in development strategies.

Second, from an institutional perspective, improving the availability of trade-related information and the institutional quality (rule of law, corruption, and regulatory quality) as well as streamlining procedures will reduce trade costs. An expansion of Bangladesh's export capacity also resulted in reduction of the WPR reduction. This implies policy-makers' efforts should target policies for improving institutional quality and also to support private sector initiatives for new investments to reduce trade costs, as these would support the aim of poverty alleviation in line with SDG 8.

Related actions are also needed by policy makers, i.e. schemes that provide access to education, digital technology, and basic services such as access to drinking water and sewage systems, by 2026. Without addressing these issues, the effect of preferential access would be limited and tariffs would impact economic activity adversely (Furceri, 2018, 2020).

In light of the global inflation crisis amplified by the COVID-19 pandemic Bangladesh, as a graduating country, must address these challenges and minimize the macroeconomic risks. Measures must focus on policies that promote export diversification and support both social protection and health systems. In line with recent evidence on ultra-poor workers (see, for example Balboni et.al 2020 and Rahman and Bandiera, 2021), we find that preferential market access for Bangladeshi exports reduced the WPR and supported higher income for workers providing them with job security and suggesting that export diversification must be a top priority for policymakers.

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