Online Appendix

A1 Relationship Between the Estimating Equation and Revenue Productivity

We show here that the revenue-based measure of productivity is a special case of our measurement of productivity. In other words, our estimating equation (10) nests revenue-based productivity under the assumption of perfect substitution between varieties within an industry. As $\sigma \to \infty$, β tends to zero, so equation (10) can be re-written as:

$$\tilde{r}_{jt} = \alpha_l l_{jt} + \alpha_k k_{jt} + \alpha_m m_{jt} + \omega_{jt} + \mu_{jt} \tag{20}$$

where productivity $\omega_{jt} = a_{jt} + ln\zeta_{jht}$ is the revenue productivity. Clearly ω_{jt} is a combination of physical productivity and the demand shifter. Equation (20) implies that in a homogeneous goods sector, firms facing high demand can be misinterpreted to be more productive than firms facing low demand, consistent with Foster et al. (2016) that use firm-level data from a homogeneous goods industry in the US and find that older firms face high demand but are less productive compared to younger firms that face low demand. This suggests that even in a homogeneous goods sector, controlling for the demand shifter is imperative in estimating productivity.

A2 Relationship Between the Estimating Equation and De Loecker (2011)

We also show the relationship between our framework and De Loecker (2011). From equations (5, 6 and 7), our estimating equation (10) can be expressed as:

$$\tilde{r}_{jt} = \underbrace{\beta_l l_{jt} + \beta_k k_{jt} + \beta_m m_{jt} + \beta_s q_{st} + \varepsilon^*_{jt} + a^*_{jt}}_{\text{de Loecker (2011)}} + \frac{1}{\sigma} ln\left(1 + \frac{R_{jf}}{R_{jh}}\right) + u_{it} \tag{21}$$

For export sales equal to zero ($R_{jf} = 0$), we obtain equation (4) in De Loecker (2011). That is:

$$r_{jt} = \beta_l l_{jt} + \beta_k k_{jt} + \beta_m m_{jt} + \beta_s q_{st} + a^*_{jt} + \varepsilon^*_{jt} + u_{it}$$

where $\beta_q = \frac{\sigma-1}{\sigma}\alpha_q$ for $q = \{l, k, m\}$; $\beta_s = \frac{1}{\sigma}$; $a^*_{jt} = a_{jt}\frac{\sigma-1}{\sigma}$ and $\varepsilon^*_{jt} = \frac{\sigma-1}{\sigma}ln(\zeta_{jt})$. The variable $(1 + \frac{R_{jf}}{R_{jh}})$ is the ratio of sales in the foreign to domestic market and depends on the size of both markets. If not controlled for, it may bias productivity estimates. The direction of the bias depends on how firms' sales in domestic and foreign markets compare to the total market sizes on the product in the respective markets. Note that equation (10) is isomorphic to equation (21). We choose the functional form in (10) because of its ease to estimate as we need not rely on estimates of the industry elasticity of substitution.

A3 Comparison Between Quality-Adjusted and Revenue Productivity

We focus on correlations and standard deviations. Table (A1) presents the summary statistics for quality-adjusted productivity, revenue productivity, domestic market share (our proxy for price), sales revenue and capital. The first important point to note is that the two productivity measures are strongly correlated and exhibit high dispersion. Unsurprisingly, revenue TFP has a higher dispersion than our Quality-Adjusted TFP measure. This is because the former is a combination of the later and firm-level prices. Firms may have responded to decreased import tariffs with the EU differently through changes in their prices, thereby causing more dispersion in revenue productivity than quantity productivity.

Table A1: Summary Statistics for Productivity Measures, Sales and Capital

	Correlations				
	Quality-Adjusted Productivity	Revenue Productivity	Sales Revenue	Capital	Market Shares
Quality-Adjusted Productivity	1.00				
Revenue Productivity	0.45**	1.00			
Sales Revenue	0.10**	0.34**	1 .00		
Capital	0.01**	-0.06**	0.80**	1.00	
Domestic Market Shares	-0.20**	0.25**	0.77**	0.58**	1.00
	Standard Deviations				
	0.777	1.083	1.936	2.356	1.944

Notes: This table shows the correlation and standard deviations for our firm-level variables. All variables are in logs. $**$, $*$ and † are 1%, 5% and 10% significant levels respectively.

We also observe a strong positive correlation between revenue productivity and domestic market share (price proxy). This is not surprising because prices are expected to have a strong positive correlation with revenue productivity. Interestingly, we observe a negative correlation between our quality-adjusted productivity and domestic market shares, consistent with more productive firms having lower marginal costs and charging lower prices. These results are consistent with the findings in Foster et al. (2016) for the United States. By comparing large and small firms, their paper reports that older firms have larger demand (thus market shares) and lower physical productivity when compared with younger firms which typically have lower demand. The strength of the negative correlation is weaker than that in Foster et al. (2008). This is either because our price proxy is noisy and does not perfectly capture variations in prices or because we use different datasets. While we observe a positive correlation between capital and quality-adjusted productivity, surprisingly, we find a negative correlation with revenue productivity. The positive correlation is consistent with more capital investments generating more productivity growth. Since revenue productivity consists of true productivity and unobserved prices, the negative correlation may be driven by changes in prices due to unobserved time-varying industry-specific conditions. When we control for industry-year fixed effects we find this relationship to be positive (Table A2).

Finally, we observe that sales has a stronger correlation with revenue TFP than it has with quality-adjusted TFP consistent with Foster et al. (2008) which is unsurprising since revenue TFP reflects prices and demand conditions. In Table (A2), we repeat the same exercise, but we control for industry-year fixed effects from each variable to ensure that aggregate industry intertemporal movements do not drive our results. Clearly, the results are very similar. In conclusion, by using firm-level datasets for Hungary and a model-driven proxy for prices, our results are similar to existing pattern for the US as documented by Foster et al. (2008) and Foster et al. (2016).

Table A2: Summary Statistics For Productivity Measures, Sales and Capital

	Correlations				
	Quality-Adjusted Productivity	Revenue Productivity	Sales Revenue	Capital	Domestic Market Shares
Quality-Adjusted Prod.	1.00				
Revenue Productivity	0.59**	1.00			
Sales Revenue	0.22**	0.41**	1.00		
Capital	0.01**	0.08**	0.74**	1.00	
Domestic Market Shares	-0.07**	0.39**	0.90**	0.64**	1.00
	Standard Deviations				
	0.58	0.98	1.97	2.31	1.93

Notes: This table shows the correlation and standard deviations of our firm-level variables using the truncated samples (1993 - 2003). All variables are in logs. We remove sector-year fixed effects from each variable prior to computing the statistics. $**$, $*$ and † are 1%, 5% and 10% significant levels respectively.

A4 Using Alternative Measure of Imported-input Tariffs

Table A3: Effects of Import Competition on Productivity

	(1)	(2)	(3)	(4)	(5)	(6)
Effective Rate	-0.055*	-0.056*	-0.014			
	(0.032)	(0.032)	(0.054)			
Lagged Tariffs				-0.060*	-0.060*	-0.014
				(0.033)	(0.033)	(0.057)
Lagged Input Tariffs				-0.035	-0.016	0.025
				(0.100)	(0.097)	(0.148)
Lagged Productivity	0.688***	0.688***	0.478***	0.689***	0.688***	0.478***
	(0.013)	(0.013)	(0.034)	(0.013)	(0.013)	(0.034)
Industry FE	yes	no	no	yes	no	no
Year FE	yes	no	yes	yes	no	yes
Industry-year FE	no	yes	no	no	yes	no
Firm FE	no	no	yes	no	no	yes
Observations	21070	21070	13972	21070	21070	13972

Notes This table reports the results of the effect of tariffs cut on firm-level productivity for all firms including firms in "Motor vehicles, trailers & semi-trailers" and Other transport equipments sector and firms with export sales more than 70% of its total sales. Robust standard errors are clustered at the industry level in parentheses. $*$, $**$ and $***$ indicates 10%, 5% and 1% significance level

Supplementary Online Appendix

S1 Model Solution

S1.1 Detailed Derivation of Revenue Equations

The first order condition of the profit maximization equation (3) yields:

$$\left(\frac{\sigma-1}{\sigma}\right) q_{jh}^{-\frac{1}{\sigma}} (\zeta_{jh}^{\sigma-1}\chi_h)^{\frac{1}{\sigma}} = \frac{(q_{jh}+q_{jf})^{\frac{1-\alpha_m}{\alpha_m}}}{\alpha_m (A_j K_j^{\alpha_m} L_j^{\alpha_l})^{\frac{1}{\alpha_m}}} \tag{22}$$

$$\frac{1}{\tau_j}\left(\frac{\sigma-1}{\sigma}\right) q_{jf}^{-\frac{1}{\sigma}} (\zeta_{jf}^{\sigma-1}\chi_f)^{\frac{1}{\sigma}} = \frac{(q_{jh}+q_{jf})^{\frac{1-\alpha_m}{\alpha_m}}}{\alpha_m (A_j K_j^{\alpha_m} L_j^{\alpha_l})^{\frac{1}{\alpha_m}}} \tag{23}$$

Recalling that $q_{jh} = \zeta_{jh}^{\sigma-1}\chi_h p_j^{-\sigma}$ and $q_{jf} = \zeta_{jf}^{\sigma-1}\chi_f (p_j\tau_j)^{-\sigma}$ and substituting in equation 22 we obtain

$$q_{jh}^{-\frac{1}{\sigma}} = \left(\frac{\sigma}{\sigma-1}\right)(\zeta_{jh}^{\sigma-1}\chi_h)^{-\frac{1}{\sigma}} \alpha_m^{-1} (A_j K_j^{\alpha_m} L_j^{\alpha_l})^{-\frac{1}{\alpha_m}} (\zeta_{jh}^{\sigma-1}\chi_h + \zeta_{jf}^{\sigma-1}\chi_f \tau^{-\sigma})^{\frac{1-\alpha_m}{\alpha_m}} (p_{jt}^{-\sigma})^{\frac{1-\alpha_m}{\alpha_m}} \tag{24}$$

We know that $(p_{jt}^{-\sigma})^{\frac{1-\alpha_m}{\alpha_m}} = q_{jh}^{\frac{1-\alpha_m}{\alpha_m}} (\zeta_{jh}^{\sigma-1}\chi_h)^{\frac{\alpha_m-1}{\alpha_m}}$ and substituting in equation 24 we have

$$q_{jh} = Z^{\sigma V} \zeta_{jh}^{\sigma-1}\chi_h (A_j K_j^{\alpha_k} L_j^{\alpha_l})^{\frac{\sigma V}{\alpha_m}} (\zeta_{jh}^{\sigma-1}\chi_h + \zeta_{jf}^{\sigma-1}\chi_f \tau^{-\sigma})^{\frac{(\alpha_m-1)\sigma V}{\alpha_m}} \tag{25}$$

Where $Z = \frac{(\sigma-1)\alpha_m}{\sigma}$ and $V = \frac{\alpha_m}{\alpha_m - \sigma(\alpha_m-1)}$. Recall revenue is $R_{jh} = p_j q_{jh} = q_{jh}^{\frac{\sigma-1}{\sigma}} \zeta_{jh}^{\frac{\sigma-1}{\sigma}} \chi_h^{\frac{1}{\sigma}}$. We already have the expression for q_{jh} in equation (25) so we can write

$$R_{jh} = Z^{V(\sigma-1)} \zeta_{jh}^{\sigma-1}\chi_h (A_j K_j^{\alpha_k} L_j^{\alpha_l})^{\frac{V(\sigma-1)}{\alpha_m}} (\zeta_{jh}^{\sigma-1}\chi_h + \zeta_{jf}^{\sigma-1}\chi_f \tau_j^{-\sigma})^{\frac{V}{\alpha_m}-1} \tag{26}$$

Similarly, substituting $q_{jh} = \zeta_{jh}^{\sigma-1}\chi_h p_j^{-\sigma}$ and $q_{jf} = \zeta_{jf}^{\sigma-1}\chi_f (p_j\tau_j)^{-\sigma}$ in equation (23) we have

$$q_{jf}^{-\frac{1}{\sigma}} = \left(\frac{\sigma}{\sigma-1}\right)(\zeta_{jf}^{\sigma-1}\chi_f)^{-\frac{1}{\sigma}} \alpha_m^{-1} \tau_j^{-\frac{1}{V}} (A_j K_j^{\alpha_m} L_j^{\alpha_l})^{-\frac{1}{\alpha_m}} (\zeta_{jh}^{\sigma-1}\chi_h + \zeta_{jf}^{\sigma-1}\chi_f \tau^{-\sigma})^{\frac{1-\alpha_m}{\alpha_m}} ((\tau_j p_{jt})^{-\sigma})^{\frac{(1-\alpha_m)}{\alpha_m}} \tag{27}$$

We know that $(\tau_j p_{jt})^{\frac{\sigma(\alpha_m-1)}{\alpha_m}} = (q_{jf}(\zeta_{jf}^{\sigma-1}\chi_f)^{-1})^{\frac{1-\alpha_m}{\alpha_m}}$ and substituting in 27

$$q_{jf} = Z^{\sigma V} \zeta_{jf}^{\sigma-1}\chi_f \tau_j^{-\sigma} (A_j K_j^{\alpha_k} L_j^{\alpha_l})^{\frac{\sigma V}{\alpha_m}} (\zeta_{jh}^{\sigma-1}\chi_h + \zeta_{jf}^{\sigma-1}\chi_f \tau_j^{-\sigma})^{\frac{(\alpha_m-1)\sigma V}{\alpha_m}} \tag{28}$$

Similarly, we can derive export sales as:

$$R_{jf} = Z^{V(\sigma-1)} \zeta_{jf}^{\sigma-1}\chi_f \tau^{-\sigma} (A_j K_j^{\alpha_k} L_j^{\alpha_l})^{\frac{V(\sigma-1)}{\alpha_m}} (\zeta_{jh}^{\sigma-1}\chi_h + \zeta_{jf}^{\sigma-1}\chi_f \tau_j^{-\sigma})^{\frac{V}{\alpha_m}-1} \tag{29}$$

Summing up equation (26 and 29) and reminding the reader that $\zeta_{jf} = \zeta_{jh}\nu_{jf}$, we obtain total sales in equation(7).

$$R_{jT} = \begin{cases} Z^{V(\sigma-1)}(A_j K_j^{\alpha_k} L_j^{\alpha_l})^{\frac{V(\sigma-1)}{\alpha_m}}(\zeta_{jh}^{\sigma-1}\chi_h)^{\frac{V}{\alpha_m}} & \text{if firm sells at home} \\ Z^{V(\sigma-1)}(A_j K_j^{\alpha_k} L_j^{\alpha_l})^{\frac{V(\sigma-1)}{\alpha_m}}\zeta_{jh}^{\frac{V(\sigma-1)}{\alpha_m}}(\chi_h + \tau_j^{-\sigma}\nu_{jf}^{\sigma-1}\chi_f)^{\frac{V}{\alpha_m}} & \text{if firm sells in both} \end{cases} \tag{30}$$

Recall price equation is $p_{jt} = q_{jh}^{-\frac{1}{\sigma}}(\zeta_{jh}^{\sigma-1}\chi_h)^{\frac{1}{\sigma}}$. Substituting equation (22) into this equation, we can express price as:

$$p_{jt} = \frac{\sigma}{\sigma-1}\frac{1}{\alpha_m}(A_j K_j^{\alpha_k} L_j^{\alpha_l})^{-\frac{1}{\alpha_m}}(q_{jh} + q_{jf})^{\frac{1-\alpha_m}{\alpha_m}}$$

So,

$$R_{jT}^{-\alpha_m} = (p_{jt}q_{jT})^{-\alpha_m} = Z^{\alpha_m}(A_j K_j^{\alpha_k} L_j^{\alpha_l})(q_{jh} + q_{jf})^{-1}$$
$$R_{jT}^{-\alpha_m} = Z^{\alpha_m} M_{jt}^{-\alpha_m} \implies Z^{\alpha_m} = M_{jt}^{\alpha_m} R_{jT}^{-\alpha_m} \tag{31}$$

To derive the estimation equation, we can substitute equation (8) and 31 into 30 rearrange and obtain the estimating equation.

S1.2 Derivation of De Loecker (2011) Version of the Model

To derive De Loecker (2011) version of our estimating equation, substitute equation (8) into 30:

$$R_{jT} = Z^{V(\sigma-1)}(A_j K_j^{\alpha_k} L_j^{\alpha_l})^{\frac{V(\sigma-1)}{\alpha_m}}\zeta_{jh}^{\frac{V(\sigma-1)}{\alpha_m}}\chi_h^{\frac{V}{\alpha_m}}\left(1 + \frac{R_{jf}}{R_{jh}}\right)^{\frac{V}{\alpha_m}}$$

Raise both sides of the equation to the power $\frac{\alpha_m}{V}$ We obtain:

$$R_{jT}^{\frac{\alpha_m}{V}} = Z^{\alpha_m(\sigma-1)}(A_j K_j^{\alpha_k} L_j^{\alpha_l})^{\sigma-1}\zeta_{jh}^{\sigma-1}\chi_h\left(1 + \frac{R_{jf}}{R_{jh}}\right)$$

Substitute Z^{α_m} in equation (31) into the above equation, rearrange and we get:

$$R_{jT}^{\frac{\alpha_m}{V}} R_{jT}^{\alpha_m(\sigma-1)} = (A_j K_j^{\alpha_k} L_j^{\alpha_l} M_j^{\alpha_m})^{\sigma-1}\zeta_{jh}^{\sigma-1} P_{sh}^{\sigma} Q_{sh}\left(1 + \frac{R_{jf}}{R_{jh}}\right)$$

$$\left(\frac{R_{jT}}{P_{sh}}\right)^{\sigma} = (A_j K_j^{\alpha_k} L_j^{\alpha_l} M_j^{\alpha_m})^{\sigma-1}\zeta_{jh}^{\sigma-1} Q_{sh}\left(1 + \frac{R_{jf}}{R_{jh}}\right)$$

Taking logs we derive the equation:

$$\tilde{r}_{jt} = \underbrace{\beta_l l_{jt} + \beta_k k_{jt} + \beta_m m_{jt} + \beta_s q_{sht} + \varepsilon_{jt}^* + a_{jt}^*}_{\text{de Loecker (2011)}} + \frac{1}{\sigma} ln\left(1 + \frac{R_{jf}}{R_{jh}}\right) + u_{it} \tag{32}$$

All the variables are as defined in section A2. If firms were non-exporters $R_{jf} = 0$ we are back to De Loecker (2011).

S2 Data, Production Function Estimates

S2.1 Data Cleaning

We follow the cleaning procedures described in preceding literature[37]. Specifically, for firms that appear in more than one sector, we assign such firm in a sector in which it appears the most. We fill in missing values of sales, employment, capital, material inputs using the average of the first previous and first subsequent period's output values. When both or any do not exist, we use the average of second or first -previous and second or first forward period's value. We only consider manufacturing firms. We list in table S1 the manufacturing sectors.

Table S1: NACE 2.0 sectors and Description

Nace	description	Nace	description
15	Food and beverages	27	Basic metals
16	Tobacco products	28	Fabricated metal products
17	Textiles	29	Machinery and equipment n.e.cc
18	Wearing Apparels	30	Computer, electronic and optical products
19	Leather and related products	31	Electrical equipment
20	Wood except furniture	32	Consumer electronics & communication equip
21	Paper and paper products	33	Optical instruments and photographic equip.
22	Printing and production of recorded media	34	Motor vehicles, trailers and semi-trailers
23	Coke and refined petroleum products	35	Other transport equipment
24	Chemical products &pharmaceuticals	36	Furniture
25	Rubber and plastic products	37	Recycling
26	Other non-metallic mineral products		

Table S2: Distribution of Total Sales and Number of Firms

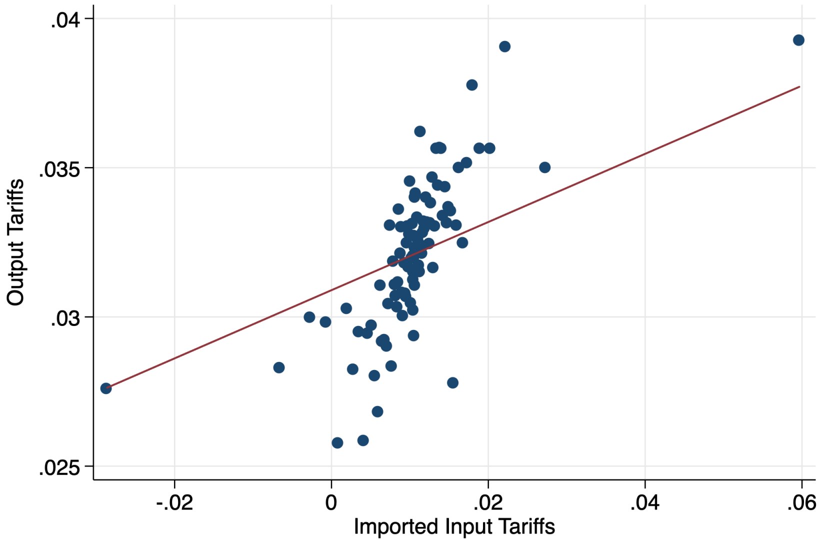
	Top 10 Percentile		Top 5 Percentile		Top 1 Percentile	
Year	Number of Firms	Share in Total Sales (%)	Number of Firms	Share in Total Sales (%)	Number of Firms	Share in Total Sales (%)
1993	1318	90.3	659	83.8	131	64.0
1994	1581	90.5	790	84.1	158	64.0
1995	1766	91.3	883	85.3	176	65.5
1996	1968	88.7	984	80.9	196	55.9
1997	2098	89.0	1049	81.5	209	57.6
1998	2349	89.0	1174	81.6	234	59.2
1999	2428	91.3	1214	85.6	242	68.3
2000	2541	91.0	1270	85.0	254	67.2
2001	1909	87.5	954	80.0	190	58.6
2002	2013	90.1	1006	84.1	201	66.7
2003	2115	90.9	1057	85.2	211	68.3

S2.2 Data Merging

We use our data in the following order:

[37] Békés et al. (2011), Bisztray (2016) etc

Figure S1: Correlation Between Firm-level Input Tariffs and Output Tariffs



Bin scatter plot of a firms' input tariffs and the import tariffs on firms' output controlling for firm and year fixed effects.

Step 1: **Create a dataset with firm characteristics and products it exports:** We proceed by aggregating the trade data at the HS-6 digit level [38], and we merge this data with the production data (using unique firm-year identifiers). Since our interest here is to identify the products exported by a firm, we drop the destination information. The data now consists of firm-level characteristics (such as sales, exports, production inputs, ownership type, etc) and each product the firm exports. There are about 35,965 observations with positive export revenue in the trade data, but they are not observed in the production data. While 15,254 observations have zero export revenue in the balance sheet data and positive export revenue in the trade data. These firms are assumed to be intermediaries (Ahn et al., 2011) that help other firms to facilitate trade. There are 90,006 observations with positive export sales in the production data, but are not observed in the trade data. These are likely to be periods when firms use intermediaries for exporting. We drop these two types of observations.

Step 2: **Determine the import tariff on the products produced by each firm**: In the tariff data, we consider only import tariffs charged on EU imports. Since the tariff data starts from 1996, we dropped years between 1993 to 1995 in the merged data in Step 1 and merged it with our tariff data using year and HS-6 product code identifiers. Our new data ranges from 1996-2003. We compute the tariffs faced by each firm in each year by taking simple averages of the tariffs of its HS-6 digit products in a given year. This

[38] As earlier stated, we aggregate at this level because the CN-10 classification for tariffs and exports is noisy. In some years, we do not observe some CN-10 tariffs which were observed in the previous period, in some other cases we observe new CN-10 not in the previous period. This pattern is rarely present at the 6-digit level

leaves us with 39128 observations and 11038 unique firm identifiers. We also compute weighted averages of tariffs, with weights defined as the share of exports in the total exports of a firm in each year. We use this measure in a robustness exercise.

Step 3: **Creating subset of the data by excluding export platforms**: During the late nineties, a large number of firms were part of the supply chain for large firms in the EU, thus domestic sales may not matter to them. These export platforms are pronounced in the auto manufacturing industry and may have little presence in other industries. Since we do not observe these firms in the data, and in order to address this potential concern, we create a sub-sample from the sample described in Step 2 by excluding firms in *Motor vehicles, trailers and semi-trailers* and *Other transport equipments* industries (NACE 2 industry 34 and 35), and firms with over 70% of export share from our sample. This new subsample consists of 27829 observations and 9071 unique firm identifiers. This will be our main sample.

S2.3 Production Function Estimation

We estimate our quality-adjusted and revenue productivity using the proxy method proposed by Levinsohn and Petrin (2000) with Ackerberg et al. (2015) corrections. We use the stata prodest estimation function developed in Mollisi and Rovigatti (2017).

Table S3: Production Function Estimation (1st Stage of 2-Step Method)

Dep. Variable:	QA Productivity		Revenue Productivity	
Log Sales	(1)	(2)	(3)	(4)
Log Capital	0.043***	0.041***	0.041***	0.039***
	(0.012)	(0.013)	(0.009)	(0.010)
Log Labour	0.237***	0.235***	0.240***	0.238***
	(0.002)	(0.003)	(0.002)	(0.001)
Log Material	0.749	0.742***	0.769***	0.764***
	(0.000)	(0.001)	(0.001)	(0.002)
Log Domestic MS	0.038***	0.040***		
	(0.003)	(0.001)		
Importers dummy		0.125***		0.116***
		(0.003)		(0.002)
Observations	39128	39126	39128	39126
Sector FE	Yes	Yes	Yes	Yes

$*$, $**$ and $***$ indicates 10%, 5% and 1% significance. MS=market share

S3 Robustness: Using Weighted Average Tariffs

In the main analysis, we have used simple average tariffs as our measure of import competition. Ideally, higher weights should be placed on the tariffs of a firm's core products[39], in order to capture the level of import competition addressed to the firm. However, we do not observe

[39] Core products here is defined as products that constitute a larger fraction of their domestic sales.

domestic sales at the product level and are agnostic on whether firms domestic sales at the product level is positively correlated with its exports[40]. As a robustness check, we compute and use the weighted average tariffs of similar products produced and exported by a firm in each time period as our measure of import competition. The weights are computed as the fraction of exports of each HS-6 product in the firm's total exports in each time period. Let z, j, t and n denote HS-6 product, firm, year and number of products respectively. That is:

$$\text{Weighted Tariffs}_{jt} = \sum_{z=1}^{n} w_{zjt}\tau_{zt}$$

$$\text{where: } w_{zjt} = \frac{\text{Exports}_{zjt}}{\text{Exports}_{jt}}.$$

We present the results of the direct approach in Tables (S5), (S4) and (S8), and for the two steps approach in Table (S6). Clearly, the results are identical to the main results.

Table S4: Effects of Import competition on Productivity: Direct Approach

	QA Productivity	Revenue Productivity
	Dependent Variable : Log Sales	
	(1)	(2)
Log Labor	0.115***	0.162***
	(0.003)	(0.002)
Log Capital	0.038***	0.047***
	(0.000)	(0.000)
Log Materials	0.456***	0.837***
	(0.005)	(0.004)
Weighted Avg.Tariffs	-0.073***	-0.150***
	(0.001)	(0.003)
Log Domestic MS	0.460***	
	(0.005)	
Industry year FE	yes	yes
Observations	27829	27829

Notes: Same as in Table S5

[40] Berman et al. (2015), shows that French firm's domestic and foreign sales are positively correlated, while Almunia et al. (2018), among others have shown a negative relationship between foreign and domestic sales

Table S5: Effects of Import competition on Productivity: Direct Approach

Dep. var:	QA-Productivity		Rev. Productivity		De Loecker (2011)	
Log. Sales	(1)	(2)	(3)	(4)	(5)	(6)
Log Labor	0.117***	0.122***	0.161***	0.165***	0.229***	0.235***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Log Capital	0.039***	0.034***	0.048***	0.044***	0.067***	0.062***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Log Materials	0.483***	0.468***	0.837***	0.831***	1.186***	1.174***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Weighted Avg.Tariffs	-0.046***	-0.018***	-0.138***	-0.117***	-0.107***	-0.093***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Log Domestic MS	0.429***	0.436***				
	(0.000)	(0.000)				
Importers Dummy		0.067***		0.052***		0.037***
		(0.000)		(0.000)		(0.000)
Foreign-Owned		0.105***		0.080***		0.057***
		(0.000)		(0.000)		(0.000)
Year FE	yes	yes	yes	yes	yes	yes
Industry FE	yes	yes	yes	yes	yes	yes
Observations	27829	27829	27829	27829	27829	27829

Notes: This table reports the results of the effect of tariff reductions on firm-level productivity employing the direct approach. Foreign is a dummy that takes the value 1 if the firm is over 50% foreign-owned and 0 if otherwise. We exclude firms in industry 34 and 35. (i.e. "Motor vehicles, trailers and semi-trailers" and other transport equipment) and firms with export sales greater than 70% of total sales to ensure that our results are not driven by export platform firms. Columns (5) and (6) reports the structural coefficients of the input variables. See Table (S8) in the appendix for the full estimates (including the elasticity parameter of de loecker (2011) model. Bootstrap standard errors are reported in parentheses. $*$, $**$ and $***$ indicate 10%, 5% and 1% significance level. MS, QA and Rev. denote market share, Quality-Adjusted and Revenue respectively.

Table S6: Estimating the Effects of Import competition on Productivity

Dependent Variable	QA Productivity			Revenue Productivity			de Loecker (2011)		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Weighted Tariffs	-0.106***			-0.137***			-0.119***		
	(0.037)			(0.038)			(0.028)		
Lag Weighted Tariffs		-0.097**	-0.037*		-0.129***	-0.047**		-0.116***	-0.040***
		(0.039)	(0.019)		(0.040)	(0.020)		(0.030)	(0.015)
Lag Productivity			0.644***			0.636***			0.621***
			(0.011)			(0.012)			(0.012)
Foreign x Lag Weighted Tariffs			0.041			0.051			0.049
			(0.041)			(0.043)			(0.032)
Importers Dummy	yes	yes	yes	yes	yes	yes	yes	yes	yes
Industry-year FE	yes	no	yes	yes	no	yes	yes	no	yes
Year FE	no	yes	no	no	yes	no	no	yes	no
Industry FE	no	yes	no	no	yes	no	no	yes	no
Observations	27827	19442	19433	27827	19442	19433	27827	19442	19433
R-squared	0.162	0.124	0.546	0.167	0.126	0.533	0.136	0.127	0.511

Notes: This table reports the results of the effect of tariff reductions on firm-level productivity. Foreign is a dummy that takes the value 1 if a firm is over 50% foreign-owned and 0 if otherwise. we exclude firms in industry 34 and 35. (That is:"Motor vehicles, trailers & semi-trailers" and Other transport equipments) and firms with export sales greater than 70% of total sales to ensure that our results are not driven by export platform firms. Bootstrap standard errors are reported in parentheses. $*$, $**$ and $***$ indicate 10%, 5% and 1% significance level.

S4 Reduced-Form Estimates of De Loecker (2011)

Table S7: Effects of Import competition Productivity: Direct Approach

	De Loecker (2011) Productivity Estimate (Full)			
	(1)	(2)	(3)	(4)
	β	α	β	α
Log Labor	0.161***	0.229***	0.166***	0.235***
	(0.000)	(0.000)	(0.000)	(0.000)
Tariffs	-0.235***	-0.165***	-0.203***	-0.143***
	(0.000)	(0.000)	(0.000)	(0.000)
Log Capital	0.048***	0.068***	0.044***	0.062***
	(0.000)	(0.000)	(0.000)	(0.000)
Log Materials	0.836***	1.187***	0.830***	1.176***
	(0.000)	(0.000)	(0.000)	(0.000)
Log Industry Output	0.296***		0.294***	
	(0.000)		(0.000)	
Elasticity of Subst.(σ)		3.38		3.40
Importers Dummy			0.051***	0.038***
			(0.000)	(0.000)
Foreign-Owned			0.078***	0.055***
			(0.000)	(0.000)
Year FE	yes	yes	yes	yes
Industry FE	yes	yes	yes	yes
Observations	27829		27829	

This table reports the production function estimates from De Loecker (2011) methodology. Columns (1) and (3) are the reduced form coefficients, while columns (2) and (4) are structural input parameters which were obtained from the reduced form parameters using the elasticity of substitution. Columns (2) and (4) are same as columns (5) and (6) in Table(5). Bootstrap standard errors are reported in parentheses. $*$, $**$ and $***$ indicate 10%, 5% and 1% significance level.

Table S8: Effects of Import competition on Productivity: Direct Approach

	De Loecker (2011) Productivity Estimate			
	(1)	(2)	(3)	(4)
	β	α	β	α
Log Labor	0.162***	0.229***	0.166***	0.235***
	(0.000)	(0.000)	(0.000)	(0.000)
Log Capital	0.047***	0.067***	0.044***	0.062***
	(0.000)	(0.000)	(0.000)	(0.000)
Log Materials	0.837***	1.186***	0.830***	1.174***
	(0.000)	(0.000)	(0.000)	(0.000)
Weighted Avg.Tariffs	-0.152***	-0.107***	-0.132***	-0.093***
	(0.000)	(0.000)	(0.000)	(0.000)
Log Industry Output	0.294***		0.293***	
	(0.000)		(0.000)	
Elasticity	3.401		3.413	
Importers Dummy			0.052***	0.037***
			(0.000)	(0.000)
Foreign-Owned			0.080***	0.057***
			(0.000)	(0.000)
Year FE	yes	yes	yes	yes
Industry FE	yes	yes	yes	yes
Observations	27829		27829	

This table reports the production function estimates from De Loecker (2011) methodology. Columns (1) and (3) are the reduced form coefficients, while columns (2) and (4) are structural input parameters which were obtained from the reduced form parameters using the elasticity of substitution. Bootstrap standard errors are reported in parentheses. $*$, $**$ and $***$ indicate 10%, 5% and 1% significance level respectively.

S5 Additional Robustness Results

In the previous analysis, robust standard errors were clustered at the industry level. So, we now repeat the analysis with robust standard errors clustered at the firm level and report the result in Table (S9) we find our results to be similar to our main results.
Next, we drop the importer's dummy in the first-step estimation of the two-step approach, and our results remain unchanged as reported in Table (S11).
Finally, we use the full sample which contains firms in the automobile industry and firms with over 70% share of exports in their total sales, and report the estimates in Table (S10), and the results remains unchanged and consistent with baseline results.

S5.1 Clustering at the firm level

Table S9: Estimating the Effects of Trade Liberalization on Productivity(clustering at firm)

Dependent Variable:	Quality-Adjusted Productivity						
	Two-Steps Approach						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Tariffs	-0.115***	-0.129***					
	(0.040)	(0.041)					
Lagged Tariffs			-0.108**	-0.050**	-0.053**	-0.059***	-0.026
			(0.042)	(0.023)	(0.023)	(0.022)	(0.039)
Lagged Productivity				0.646***	0.644***	0.644***	0.102***
				(0.011)	(0.011)	(0.011)	(0.020)
Foreign x Lag Tariffs						0.046	
						(0.040)	
Dependent Variable:	Revenue Productivity						
	Two-Steps Approach						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Tariffs	-0.164***	-0.177***					
	(0.041)	(0.042)					
Lagged Tariffs			-0.160***	-0.065***	-0.068***	-0.076***	-0.029
			(0.043)	(0.024)	(0.024)	(0.023)	(0.040)
Lagged Productivity				0.638***	0.635***	0.635***	0.101***
				(0.011)	(0.012)	(0.012)	(0.021)
Foreign x Lag Tariffs						0.057	
						(0.042)	
Importers dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	No	No	No	No	No	No	Yes
Industry-Year FE	No	Yes	No	No	Yes	Yes	Yes
Year FE	Yes	No	Yes	Yes	No	No	No
Industry FE	Yes	No	Yes	Yes	No	No	No
Observations	27827	27827	19442	19442	19442	19433.000	19442
R-squared	0.132	0.163	0.093	0.532	0.546	0.546	0.275

Notes This table reports the results of the effect of tariffs cut on firm-level productivity. Foreign is a dummy that takes a value=1 if firm is foreign-owned and 0 if domestic or state-owned. I excluded firms in industry 34 and 35 (i.e. "Motor vehicles, trailers and semi-trailers" and Other transport equipments) and firms with export sales more than 70% of its total sales to ensure that our results are not driven by export platform firms. In column 1-7 robust standard errors are clustered at the **firm level** in parentheses. $*$, $**$ and $***$ indicates 10%, 5% and 1% significant levels.

S5.2 Estimating with the Full Sample

Table S10: Estimating the Effects of Trade Liberalization on Productivity (Full Sample)

Dependent Variable:	Quality-Adjusted Productivity						
	Two-Steps Approach						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Tariffs	-0.118***	-0.144***					
	(0.027)	(0.019)					
Lagged Tariffs			-0.099***	-0.045**	-0.050**	-0.063**	-0.023*
			(0.022)	(0.022)	(0.021)	(0.027)	(0.013)
Lagged Productivity				0.656***	0.655***	0.654***	0.146***
				(0.021)	(0.022)	(0.022)	(0.018)
Foreign x Lag Tariffs						0.082*	
						(0.042)	
Dependent Variable:	Revenue Productivity						
	Two-Steps Approach						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Tariffs	-0.162***	-0.185***					
	(0.024)	(0.017)					
Lagged Tariffs			-0.143***	-0.060**	-0.065***	-0.076***	-0.026**
			(0.019)	(0.023)	(0.022)	(0.027)	(0.012)
Lagged Productivity				0.629***	0.628***	0.627***	0.139***
				(0.022)	(0.022)	(0.022)	(0.017)
Foreign x Lag Tariffs						0.066*	
						(0.034)	
Importers dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	No	No	No	No	No	No	Yes
Industry-Year FE	No	Yes	No	No	Yes	Yes	Yes
Year FE	Yes	No	Yes	Yes	No	No	No
Industry FE	Yes	No	Yes	Yes	No	No	No
Observations	39126	39126	28054	28054	28054	28044	28054

Notes: This table reports the results of the effect of tariffs on firm-level productivity using the full sample. Foreign is a dummy that takes a value 1 if firm is foreign-owned and 0 if domestic or state-owned. In column 1-7 robust standard errors are clustered at the industry level in parentheses. $*$, $**$ and $***$ indicates 10%, 5% and 1% significant levels.

S5.3 Estimates Without Controlling For Importer's Dummy

Table S11: Estimating the Effects of Trade Liberalization on Productivity

Dependent Variable:	QA Productivity						
	Two-Steps Approach						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Tariffs	-0.147***	-0.161***					
	(0.012)	(0.014)					
Lagged Tariffs			-0.135***	-0.059*	-0.061**	-0.069**	-0.015
			(0.021)	(0.031)	(0.028)	(0.030)	(0.010)
Lag Productivity				0.652***	0.650***	0.650***	0.109***
				(0.017)	(0.017)	(0.017)	(0.010)
Foreign x Lag Tariffs						0.059***	
						(0.014)	
Dependent Variable:	Revenue Productivity						
	Two-Steps Approach						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Tariffs	-0.193***	-0.207***					
	(0.013)	(0.014)					
Lagged Tariffs			-0.185***	-0.073**	-0.075**	-0.085**	-0.015
			(0.022)	(0.032)	(0.029)	(0.031)	(0.010)
Lagged Productivity				0.644***	0.642***	0.641***	0.107***
				(0.018)	(0.018)	(0.018)	(0.011)
Foreign x Lag Tariffs						0.070***	
						(0.019)	
Importers dummy	No	No	No	No	No	No	No
Firm FE	No	No	No	No	No	No	Yes
Industry-Year FE	No	Yes	No	No	Yes	Yes	Yes
Year FE	Yes	No	Yes	Yes	No	No	No
Industry FE	Yes	No	Yes	Yes	No	No	No
Observations	27829	27829	19444	19444	19444	19435	19444

Notes This table reports the results of the effect of tariffs cut on firm-level productivity. Foreign is a dummy that takes a value=1 if firm is foreign-owned and 0 if domestic or state-owned. I excluded firms in industry 34 and 35 (i.e. "Motor vehicles, trailers and semi-trailers" and Other transport equipments) and firms with export sales more than 70% of its total sales to ensure that our results are not driven by export platform firms. In column 1-7 robust standard errors are clustered at the industry level in parentheses. $*$, $**$ and $***$ indicates 10%, 5% and 1% significant levels.