Online Appendix:

Tariffs and Firm Performance in Ethiopia

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Document description: This appendix contains additional material for the study "Tariffs and Firm Performance in Ethiopia" by Arne Bigsten, Mulu Gebreeyesus and Måns Söderbom.

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A.1 Construction of variables

Industry level price deflator

Following the methodology by MoFED we generated an industry specific price deflator by dividing value added at factor cost to the value added at constant price for each 17 industries. The industry level value added at factor cost, here defined as gross value of production minus intermediate costs and indirect taxes, is available in the CSA publication. Value added at constant price, on the other hand, was derived by dividing value added at factor cost by industry specific production index. The production index is not easily available and we had to construct it using detail and product level information again from the CSA survey reports. We collected yearly quantity and value of production of 106 products for the period 1997-2006. Then we constructed production index for each 17 industries weighted by the share of each product in the given industry in a base year, here 2000.

We use the following formula to generate industry level production index. $\sum_i^k (\boldsymbol{V_{i0}} \times (\boldsymbol{Q_{it}}/\boldsymbol{Q_{i0}}))/\sum_i^k \boldsymbol{V_{i0}}$, where V_{i0} denotes values of product i at base year (i.e. 2000), Q_{it} and Q_{0t} quantity of product i produced respectively at time t and base year, and i-k a range of products produced in industry J**.** To correct for the missed and some unreliable figures we use average of pre and post price index or linear projection if it is for extended period. But some products that could not be easily fixed are dropped from the calculation. Moreover, we apply the average manufacturing price index (again generated through industry weighting) for two industries (vehicle assembly and furniture) that we could not find full series of product price.

Capital stock

The capital stock is calculated as $K_{it} = K_{it-1} + (I_t / p^t) - \delta K_{it-1} - sK_{it}$ where K_{it-1} denotes the beginning year capital, p^t investment deflator, δ depreciation rate and sK_{it} sold assets in year t. We used different depreciation rates for different types of assets; 8 percent for machinery and equipment, 5 percent for buildings, and 10 percent for vehicle and furniture and fixture. Investment deflator was found from MoFED. For each firm we took the beginning year capital (when it entered the data set) as a base and constructed a capital stock sequentially by adding investment and subtracting sold assets and depreciation. Then we derived a new capital stock series (K) by taking the average of the beginning and the end year capital stock for use throughout our analysis.

Intermediate inputs tariffs

We use the CSA production data and the ECA tariff data to generate tariff rates on intermediate inputs. We began by listing all the inputs used by the firms. This information is available in the module on inputs in the firm-level production dataset. We then assign a HS number to each input identified in the data, enabling us to merge the input data with the customs data on input tariffs for specific products. Using the firm-level data, we compute the total value of inputs used for each subsector (defined at the 4-digit ISIC level) and input type in the data. We then aggregate input values over different inputs, within each subsector, and compute the share of a particular input in total inputs for each product within the sector. These shares will be constant over time. We then merge the shares data with the tariff data, and, for

each sector and year, compute a weighted average of the input tariff with weights based on shares calculated as described above.

We also consider results based a firm-level measure of input tariffs. This measure is constructed in the same was as described above, except that the input shares are computed at the level of the firm rather than at the level of the subsector.

A.2 Additional tables

Table A.1: Number of establishments and employment

	Number of firms		Growth # of firms	Total employment		Sector share of employment		Growth employ-ment	Mean firm size (empl)		Median firm size (empl)	
	1997	2004	1997-2004	1997	2004	1997	2004	1997-2004	1997	2004	1997	2004
Food	179	294	64.2	26926	31238	28.1	29.7	16.0	150	106	21	24.5
Textile	59	73	23.7	31839	26677	33.2	25.4	-16.2	540	365	51	58
Leather	61	62	1.6	8226	7575	8.6	7.2	-7.9	135	122	27	49.5
Wood	132	185	40.2	5680	6822	5.9	6.5	20.1	43	37	20.5	16
Paper	46	73	58.7	5122	6929	5.3	6.6	35.3	111	95	24.5	35
chemical	64	87	35.9	6124	9306	6.4	8.9	52.0	96	107	36	59
Non-metallic	89	119	33.7	6745	9170	7.0	8.7	36.0	76	77	17	19
Fabricated metal	72	103	43.1	4377	6594	4.6	6.3	50.7	61	64	20.5	30
Total	703	997	41.8	95992	105095			9.5	137	105	23	26

Note: For presentational purposes we distinguish industries according to the 3-digit ISIC classification here. In the econometric analysis in the paper, we define sectors at the 4-digit level

Table A.2: Tariffs, import penetration, imported inputs and export ratios

		Average Output Tariff (% of CIF import value)			Average Input Tariff (% of CIF import value)			Import penetration ratio			Imported inputs ratio			Export share of sales		
ISIC code		1997	2001	2005	1997	2001	2005	1997	2001	2005	1997	2001	2005	1997	2001	2005
151-153	Food	29	29	24	24	14	11	0.08	0.20	0.20	0.10	0.14	0.09	0.01	0.09	0.12
154	Other food	30	17	22	26	28	25	0.22	0.38	0.21	0.06	0.10	0.03	0.28	0.08	0.26
155	Beverage	18	12	10	18	14	13	0.03	0.05	0.02	0.43	0.36	0.52	0	0	0
160	Tobacco	Na	26	32	30	20	20	na	0.03	0.06	0.84	0.73	0.43	0	0	0
170	Textile	27	25	16	11	12	11	0.30	0.22	0.20	0.42	0.38	0.50	0.04	0.11	0.08
180	Garment	46	39	34	27	24	24	0.40	0.55	0.86	0.31	0.07	0.21	0.04	0.02	0.00
191	Leather	29	31	29	na	10	10	0.08	0.04	0.03	0.13	0.12	0.11	na	0.67	0.76
192	Footwear	48	39	33	28	24	21	0.31	0.23	0.07	0.51	0.51	0.45	0	0.01	0.12
200	Wood	7.3	8.3	3.2	34	19	7.6	0.52	0.60	0.71	0.45	0.63	0.48	0	0	0
360	Furniture	19	20	26	6.9	5.3	4.3	0.29	0.24	0.19	0.22	0.35	0.42	0	0	0
210	Paper	12	12	9.2	12	8.9	5.9	0.50	0.47	0.28	0.90	0.91	0.96	0	0	0
220	Printing	12	8.7	9.8	19	15	10	0.44	0.35	0.14	0.48	0.37	0.74	0	0	0
241	Ind. Chemicals	6.8	3.8	3.3	9.5	9.1	9.5	0.92	0.94	0.90	0.32	0.47	0.52	0	0	0
242	Other chemicals	20	15	9.7	11	12	7	0.55	0.57	0.52	0.79	0.77	0.86	0	0	0
251	Rubber	14	10	12	5.2	6.2	5.8	0.64	0.54	0.53	0.98	0.98	1.00	0	0	0
252	Plastic	30	27	22	5.4	6.2	5.9	0.39	0.32	0.32	0.92	0.95	0.97	0	0	0
261	Glass	18	17	11	0.9	0.7	1.6	0.73	0.70	0.75	0.14	0.34	0.22	0	0	0
269	Non-metal	12	17	21	3.1	6.9	6.9	0.15	0.07	0.05	0.06	0.08	0.15	0	0	0
270	Basic iron	6.8	6.9	7.6	7.0	5.2	6.0	0.70	0.54	0.43	0.99	0.99	0.61	0	0	0
280	Fabricated metal	15	11	12	8.6	6.9	5.3	0.77	0.99	0.49	0.77	0.77	0.81	0	0	0

Table A.3
Value-Added Regressions with Controls for Inputs

	(1) Log Value Added per Worker	(2) Log Value Added
Output tariff	0.133	0.129
	(0.309)	(0.310)
Input tariff	-0.791	-0.816
	(0.413)*	(0.412)**
Log Capital Labor Ratio	0.200	
	(0.035)***	
Log Capital		0.246
		(0.046)***
Log Labor		0.844
		(0.047)***
Year dummies	Yes	yes
Firm fixed effects	Yes	yes
Observations	6268	6268
Firms	1738	1738
H_0: Constant returns to scale (p-value)		0.135

Note: All regressions are estimated by means of OLS. The within transformation is used in order to eliminate the firm fixed effects. Firm-level clustered (robust) standard errors are shown in parentheses. * denotes statistical significance at the 10% level; ** significant at the 5% level; *** significant at the 1% level.