

# Online Appendix

## Trade Induced Skill Upgrading

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January 23, 2017

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Table A1: Descriptive Statistics for Portugal

Variables	Definition	Mean	Sd
<b>Wage gaps and skill variables:</b>			
w90/w50	Ratio of the 90th to 50th percentile of the wage distribution at the industry level	1.747	0.224
w50/w10	Ratio of the 50th to 10th percentile of the wage distribution at the industry level	1.529	0.223
Skill definition 1-mean	Continuous skill variable estimated from AKM, systematic component	0.721	0.060
Skill definition 1-sd		0.130	0.015
Skill definition 2-mean	Continuous skill variable estimated from AKM, systematic component without age	0.168	0.048
Skill definition 2-sd		0.076	0.013
Skill definition 3-mean	Continuous skill variable estimated from AKM, systematic component without age and tenure	0.132	0.043
Skill definition 3-sd		0.058	0.013
Skill definition 4-mean	Continuous skill variable based on years of formal education	7.400	1.938
Skill definition 4-sd		3.810	0.708
Skill definition 5-mean	Continuous skill variable based on Portela et al. (2001)	7.592	1.231
Skill definition 5-sd		2.572	0.471
<b>Trade variables:</b>			
Export	Log of real export volumes	17.255	4.218
Export North	Log of real export volumes to developed countries	16.012	3.608
Export South	Log of real export volumes to non developed countries	15.933	5.860
Import	Log of real import volumes	18.114	2.953
<b>Control variables</b>			
Productivity	Log average total sales per employee	11.083	0.941
Capital intensity	Log of average capital stock per employee	-	-
Males	Average share of male employees	0.623	0.205
Age	Average employees' age	38.281	2.684
Work experience	Average work experience	6.849	2.451
Tenure	Average tenure (years for DK; months for PT)	119.262	42.414
Skill1	Average share of employees with secondary education	0.180	0.112
Skill2	Average share of employees with tertiary education	0.084	0.11
N		1,135	

*Notes:* All descriptive statistics are calculated as averages over the period 1993-2012. Trade and accounting variables are in Euros. Firm level capital intensity is not available for Portugal and employees' tenure is measured in months.

Table A2: Effects of Trade Activity on the Wage gap and Skill Distribution: The Role of Export Destination in Portugal

<b>Step 1</b>	w90/w50	w50/w10		
Export North	0.029 (0.023)	0.042 (0.028)		
Export South	-0.005 (0.028)	-0.036 (0.035)		
F stat	122.88	122.88		
N	1,102	1,102		
R-sq	0.549	0.328		
<b>Step 2, skill definition 1</b>	Mean	SD	Mean	SD
Predicted (w90/w50), one-year lag	omitted	omitted		
Predicted (w50/w10), one-year lag			omitted	omitted
N	1,042	1,042	1,042	1,042
R-sq	0.966	0.756	0.966	0.756

*Notes:* Skill definition 1 is based on the whole systematic component of the two-way fixed effects wage regression. In step 1, standard errors are clustered at the industry level. In step 2, standard errors are clustered at the industry level and sequentially bootstrapped with step 1, 200 replications. Both steps also include the following control variables: sales per employee, workforce composition characteristics, year and 2-digit industry dummies. Significance levels: \*\*\*1%, \*\*5%, \*10%.

Table A3: Effects of Trade Activity on the Wage Gap and Skill Distribution: Alternative Skill Definitions for Portugal

<b>Step 2, skill definition 2</b>	Mean	SD	Mean	SD
Predicted (w90/w50), one-year lag	-0.005 (0.009)	-0.001 (0.006)		
Predicted (w50/w10), one-year lag			-0.010 (0.019)	-0.002 (0.012)
N	1,064	1,064	1,064	1,064
R-sq	0.957	0.857	0.957	0.857
<b>Step 2, skill definition 3</b>	Mean	SD	Mean	SD
Predicted (w90/w50), one-year lag	-0.003 (0.008)	-0.001 (0.005)		
Predicted (w50/w10), one-year lag			-0.006 (0.016)	-0.001 (0.008)
N	1,064	1,064	1,064	1,064
R-sq	0.954	0.923	0.954	0.923
<b>Step 2, skill definition 4</b>	Mean	SD	Mean	SD
Predicted (w90/w50), one-year lag	-0.501 (0.430)	-0.246 (0.158)		
Predicted (w50/w10), one-year lag			-0.899 (0.749)	-0.442 (0.342)
N	1,064	1,064	1,064	1,064
R-sq	0.971	0.783	0.971	0.783
<b>Step 2, skill definition 5</b>	Mean	SD	Mean	SD
Predicted (w90/w50), one-year lag	-0.426 (0.279)	-0.003 (0.132)		
Predicted (w50/w10), one-year lag			-0.766 (0.591)	-0.005 (0.230)
N	1,064	1,064	1,064	1,064
R-sq	0.932	0.914	0.932	0.914

*Notes:* Skill definitions 2 and 3 are based on the systematic component of the two-way fixed effects wage regression respectively without age and without age and tenure. Skill definition 4 is based on years of education whereas skill definition 5 is the multidimensional index as in Portela et al. (2001). Both steps also include the following control variables: sales per employee, workforce composition characteristics, year and 2-digit industry dummies. In step 2, standard errors are clustered at the industry level and sequentially bootstrapped with step 1, 200 replications. Significance levels: \*\*\*1%, \*\*5%, \*10%.

Table A4: Effects of Trade Activity on the Wage Gap and Skill Distribution: The role of Imports in Portugal

<b>Step 1</b>	w90/w50	w50/w10		
Import	0.042*** (0.005)	0.024*** (0.005)		
F stat	281.17	281.17		
N	1,126	1,126		
R-sq	0.604	0.610		
<b>Step 2, skill definition 1</b>	Mean	SD	Mean	SD
Predicted (w90/w50), one-year lag	-0.016 (0.023)	0.036 (0.029)		
Predicted (w50/w10), one-year lag			-0.027 (0.047)	0.061 (0.045)
N	1,064	1,064	1,064	1,064
R-sq	0.920	0.667	0.920	0.667

*Notes:* Skill definition 1 is based on the whole systematic component of the two-way fixed effects wage regression. In step 1, standard errors are clustered at the industry level. In step 2, standard errors are clustered at the industry level and sequentially bootstrapped with step 1, 200 replications. Both steps also include the following control variables: sales per employee, workforce composition characteristics, year and 2-digit industry dummies. Significance levels: \*\*\*1%, \*\*5%, \*10%.

Table A5: Effects of Trade Activity on the Wage Gap and Skill Distribution: High-Tech Sectors in Portugal

<b>Step 1</b>	w90/w50	w50/w10		
Export	0.012 (0.007)	0.051*** (0.007)		
F stat	83.945	83.945		
N	186	186		
R-sq	0.793	0.831		
<b>Step 2, skill definition 1</b>	Mean	SD	Mean	SD
Predicted (w90/w50), one-year lag	omitted	omitted		
Predicted (w50/w10), one-year lag			-0.044* (0.024)	-0.002 (0.009)
N	176	176	176	176
R-sq	0.957	0.746	0.975	0.746

*Notes:* Skill definition 1 is based on the whole systematic component of the two-way fixed effects wage regression. In step 1, standard errors are clustered at the industry level. In step 2, standard errors are clustered at the industry level and sequentially bootstrapped with step 1, 200 replications. Both steps also include the following control variables: sales per employee, workforce composition characteristics, year and 2-digit industry dummies. Significance levels: \*\*\*1%, \*\*5%, \*10%.

Table A6: Effects of Trade Activity on the Wage Gap and Skill Distribution: Low-Tech Sectors in Portugal

<b>Step 1</b>	w90/w50	w50/w10		
Export	0.049*** (0.006)	0.002 (0.005)		
F stat	135.99	135.99		
N	940	940		
R-sq	0.433	0.638		
<b>Step 2, skill definition 1</b>	Mean	SD	Mean	SD
Predicted (w90/w50), one-year lag	0.0001 (0.008)	0.017* (0.009)		
Predicted (w50/w10), one-year lag			omitted	omitted
N	888	888	888	888
R-sq	0.970	0.791	0.970	0.783

*Notes:* Skill definition 1 is based on the whole systematic component of the two-way fixed effects wage regression. In step 1, standard errors are clustered at the industry level. In step 2, standard errors are clustered at the industry level and sequentially bootstrapped with step 1, 200 replications. Both steps also include the following control variables: sales per employee, workforce composition characteristics, year and 2-digit industry dummies. Significance levels: \*\*\*1%, \*\*5%, \*10%.

Table A7: Robustness Check for the Instrumental Variable: the Role of Correlated Business Cycles across Countries in Portugal

<b>Step 1</b>	w90/w50	w50/w10		
Export	0.036*** (0.004)	0.019*** (0.004)		
F stat	209.547	209.547		
N	1,137	1,137		
R-sq	0.555	0.598		
<b>Step 2, skill definition 1</b>	Mean	SD	Mean	SD
Predicted (w90/w50), one-year lag	-0.015 (0.011)	0.009 (0.007)		
Predicted (w50/w10), one-year lag			-0.028 (0.021)	0.017 (0.015)
N	1,064	1,064	1,064	1,064
R-sq	0.966	0.754	0.966	0.754

*Notes:* Skill definition 1 is based on the whole systematic component of the two-way fixed effects wage regression. In step 1, standard errors are clustered at the industry level. In step 2, standard errors are clustered at the industry level and sequentially bootstrapped with step 1, 200 replications. Both steps also include the following control variables: sales per employee, workforce composition characteristics, year and 2-digit industry dummies. Significance levels: \*\*\*1%, \*\*5%, \*10%.

Table A8: Robustness Check for the Instrumental Variable: the Role of Correlated Technology or Demand Shocks (Colantone and Crino', 2014) in Portugal

<b>Step 1</b>	w90/w50	w50/w10		
Export	0.037*** (0.004)	0.004 (0.004)		
F stat	275.67	275.67		
N	979	979		
R-sq	0.584	0.675		
<b>Step 2, skill definition 1</b>	Mean	SD	Mean	SD
Predicted (w90/w50), one-year lag	-0.013 (0.012)	-0.006 (0.005)		
Predicted (w50/w10), one-year lag			omitted	omitted
N	925	925	925	925
R-sq	0.966	0.779	0.966	0.777

*Notes:* Skill definition 1 is based on the whole systematic component of the two-way fixed effects wage regression. In step 1, standard errors are clustered at the industry level. In step 2, standard errors are clustered at the industry level and sequentially bootstrapped with step 1, 200 replications. Both steps also include the following control variables: sales per employee, workforce composition characteristics, year and 2-digit industry dummies. Significance levels: \*\*\*1%, \*\*5%, \*10%.

Table A9: Robustness Check for the Instrumental Variable: the Role of Correlated Technology or Demand Shocks (Autor et al., 2013) in Portugal

<b>Step 1</b>	w90/w50	w50/w10		
Export	0.026*** (0.004)	0.025*** (0.005)		
F stat	166.11	166.11		
N	921	921		
R-sq	0.647	0.512		
<b>Step 2, skill definition 1</b>	Mean	SD	Mean	SD
Predicted (w90/w50), one-year lag	-0.036* (0.020)	0.008 (0.010)		
Predicted (w50/w10), one-year lag			-0.035 (0.029)	0.009 (0.013)
N	870	870	870	870
R-sq	0.966	0.766	0.966	0.766

*Notes:* Skill definition 1 is based on the whole systematic component of the two-way fixed effects wage regression. In step 1, standard errors are clustered at the industry level. In step 2, standard errors are clustered at the industry level and sequentially bootstrapped with step 1, 200 replications. Both steps also include the following control variables: sales per employee, workforce composition characteristics, year and 2-digit industry dummies. Significance levels: \*\*\*1%, \*\*5%, \*10%.

Table A10: Effects of Trade Activity on the Wage Gap and Skill Distribution: Two- and Three-year lags in Portugal

<b>Step 2, skill definition 1</b>	Mean	SD	Mean	SD
Predicted (w90/w50), two-year lag	-0.015 (0.012)	0.006 (0.008)		
Predicted (w50/w10), two-year lag			-0.027 (0.022)	0.012 (0.017)
N	1,003	1,003	1,003	1,003
R-sq	0.964	0.760	0.964	0.760
<b>Step 2, skill definition 1</b>	Mean	SD	Mean	SD
Predicted (w90/w50), three-year lag	-0.020 (0.014)	0.004 (0.008)		
Predicted (w50/w10), three-year lag			-0.036 (0.025)	0.007 (0.015)
N	942	942	942	942
R-sq	0.962	0.765	0.962	0.765

*Notes:* Skill definition 1 is based on the whole systematic component of the two-way fixed effects wage regression. Both steps also include the following control variables: sales per employee, workforce composition characteristics, year and 2-digit industry dummies. In step 1, standard errors are clustered at the industry level. In step 2, standard errors are clustered at the industry level and sequentially bootstrapped with step 1, 200 replications. Significance levels: \*\*\*1%, \*\*5%, \*10%.