

Additional material for the paper

“Employment Effects of Service Offshoring: Evidence from Matched Firms”

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Notes:

- 1) Tables 1, 4, and 8 in this file correspond to Tables 1, 2, and 3 in the text;
- 2) Tables 2, 3, 5, 6 and 7 contain unreported results and robustness checks.

Table 1 - Descriptive Statistics

	<i>Firms:</i>		<i>Treated (N_T = 516)</i>		<i>Treated (N_T = 287)</i>	
	<i>Control (N_C = 2,563)</i>	<i>Treatment:</i>	<i>SOS</i>		<i>SOS_{BUS}</i>	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
<i>a) Outcomes</i>						
Log Employment, 2003	3.776	0.911	4.353	1.063	4.508	1.125
Share of College Graduates, 2003	0.047	0.069	0.072	0.084	0.085	0.098
<i>b) Pre-Treatment Characteristics</i>						
<i>b1) Structural Variables</i>						
Log Output, 2002	15.907	1.135	16.661	1.199	16.819	1.233
Log Average Wage, 2002	10.271	0.492	10.347	0.594	10.396	0.543
Log Value Added per Worker, 2002	11.404	0.655	11.534	0.714	11.546	0.677
Log Inputs per Worker, 2002	11.299	1.071	11.584	1.001	11.581	0.952
Log Capital per Worker, 2002	10.201	1.188	10.397	1.238	10.346	1.304
Share of Workers with Fixed-Term Contracts, 2002	0.037	0.119	0.040	0.106	0.035	0.085
Indicator: Quoted on the Stock Market	0.008	0.088	0.016	0.124	0.017	0.131
Indicator: Belongs to a Group	0.243	0.429	0.440	0.497	0.467	0.500
Indicator: Credit Constrained	0.139	0.346	0.136	0.343	0.111	0.315
<i>b2) Training, Investment and Technology Variables</i>						
Share of Workers in Professional Training Courses, 2002	0.045	0.120	0.082	0.171	0.088	0.185
R&D / Sales, 2002	0.016	0.327	0.016	0.087	0.015	0.049
ICT Share of Total Investment, 2001-2003	0.107	0.184	0.118	0.174	0.117	0.162
<i>b3) Internationalization Variables</i>						
Indicator: Foreign Direct Investment	0.025	0.155	0.078	0.268	0.070	0.255
Indicator: Participated by a Foreign Firm	0.056	0.230	0.151	0.359	0.209	0.407
Indicator: Exporter	0.700	0.459	0.926	0.261	0.937	0.243
Indicator: Offshored Intermediate Inputs	0.164	0.371	0.252	0.435	0.293	0.456

Source: Unicredit-Capitalia. The treatment indicator *SOS* takes a value of 1 if the firm offshored any types of services in 2003. *SOS_{BUS}* takes a value of 1 only if the firm offshored business services. Control firms are those with no service offshoring.

Table 2 - Covariate Balancing Tests

	No. of treated firms	No. of control firms	No. of treated firms off support	Median bias before matching	Median bias after matching	% reduction in median bias	Logit Ps. R ² before matching	Logit Ps. R ² after matching
<i>Specification 1</i>								
Treatment: SOS	516	2,563	1	16.16	4.51	72.10	0.07	0.01
Treatment: SOS _{BUS}	287	2,563	3	21.32	4.01	81.20	0.09	0.01
<i>Specification 2</i>								
Treatment: SOS	516	2,563	2	15.05	1.80	88.00	0.08	0.00
Treatment: SOS _{BUS}	287	2,563	6	16.47	3.68	77.70	0.10	0.01
<i>Specification 3</i>								
Treatment: SOS	516	2,563	11	20.36	2.91	85.70	0.12	0.01
Treatment: SOS _{BUS}	287	2,563	11	22.69	3.36	85.20	0.15	0.02
<i>Specification 4</i>								
Treatment: SOS	516	2,563	11	19.00	1.71	91.00	0.12	0.01
Treatment: SOS _{BUS}	287	2,563	11	21.38	2.62	87.80	0.15	0.01

Covariate balancing tests for four specifications of the propensity score. *Specification 1* only conditions on the 'structural variables' listed in Table 1, panel b1). *Specification 2* adds the 'training, investment and technology variables' reported in panel b2). *Specification 3* further adds the 'internationalization variables' reported in panel b3). *Specification 4* also controls for import penetration at the level of 2-digit NACE industries in the year 2002. The common support restriction is implemented by deleting the offshoring firms whose propensity score is higher than the maximum or lower than the minimum propensity score of the matched non-offshoring firms.

Table 3 - Covariate Balancing Tests (2)

	No. of treated firms	No. of control firms	No. of treated firms off support	Median bias before matching	Median bias after matching	% reduction in median bias	Logit Ps. R ² before matching	Logit Ps. R ² after matching
<i>Specification 1</i>								
Treatment: SOS	516	2,563	5	16.16	3.74	76.90	0.07	0.01
Treatment: SOS _{BUS}	287	2,563	3	21.32	4.01	81.20	0.09	0.01
<i>Specification 2</i>								
Treatment: SOS	516	2,563	5	15.05	1.83	87.80	0.08	0.00
Treatment: SOS _{BUS}	287	2,563	4	16.47	4.27	74.10	0.10	0.01
<i>Specification 3</i>								
Treatment: SOS	516	2,563	7	20.36	2.65	87.00	0.12	0.01
Treatment: SOS _{BUS}	287	2,563	11	22.69	3.36	85.20	0.15	0.02
<i>Specification 4</i>								
Treatment: SOS	516	2,563	7	19.00	1.96	89.70	0.12	0.01
Treatment: SOS _{BUS}	287	2,563	11	21.38	2.62	87.80	0.15	0.01

The common support restriction is implemented by trimming the 1% of offshoring firms with the lowest density of the propensity score of control firms. See also note to Table 2.

Table 4 - Baseline Results

	a) Outcome: Log Employment					b) Outcome: Share of College Graduates				
	OLS	ATT				OLS	ATT			
		Spec. 1	Spec. 2	Spec. 3	Spec. 4		Spec. 1	Spec. 2	Spec. 3	Spec. 4
Treatment: SOS	0.577*** [0.050]	0.025 [0.069]	0.028 [0.070]	0.021 [0.072]	-0.026 [0.070]	0.024*** [0.004]	0.018*** [0.005]	0.018*** [0.005]	0.015*** [0.005]	0.018*** [0.005]
Treatment: SOS _{BUS}	0.732*** [0.069]	-0.023 [0.093]	0.002 [0.096]	0.004 [0.092]	-0.070 [0.093]	0.038*** [0.006]	0.024*** [0.008]	0.020** [0.008]	0.023*** [0.008]	0.028*** [0.007]

OLS estimates are obtained by regressing the outcome on a constant and the treatment. The ATT's are obtained using single nearest-neighbor matching with replacement. The common support restriction is implemented by deleting the offshoring firms whose propensity score is higher than the maximum or lower than the minimum propensity score of the matched non-offshoring firms. Analytical standard errors are reported in brackets. ***, **, *: indicate significance at 1, 5, and 10% level, respectively.

Table 5 - Baseline Results (2)

	a) Outcome: Log Employment					b) Outcome: Share of College Graduates				
	OLS	ATT				OLS	ATT			
		Spec. 1	Spec. 2	Spec. 3	Spec. 4		Spec. 1	Spec. 2	Spec. 3	Spec. 4
Treatment: SOS	0.577*** [0.050]	0.015 [0.068]	0.025 [0.070]	0.025 [0.073]	-0.021 [0.070]	0.024*** [0.004]	0.018*** [0.005]	0.018*** [0.005]	0.015*** [0.005]	0.017*** [0.005]
Treatment: SOS _{BUS}	0.732*** [0.069]	-0.023 [0.093]	0.009 [0.096]	0.004 [0.092]	-0.070 [0.093]	0.038*** [0.006]	0.024*** [0.008]	0.020** [0.008]	0.023*** [0.008]	0.028*** [0.007]

The common support restriction is implemented by trimming (1% caliper). See also note to Table 4.

Table 6 - Alternative Matching Estimators

	a) Outcome: Log Employment						b) Outcome: Share of College Graduates					
	OLS	ATT					OLS	ATT				
		NND	NNA	NN10	Radius	Kernel		NND	NNA	NN10	Radius	Kernel
Treatment: SOS	0.577*** [0.050]	0.016 [0.062]	0.020 [0.063]	0.007 [0.053]	0.002 [0.051]	0.038 [0.051]	0.024*** [0.004]	0.012** [0.005]	0.017*** [0.005]	0.013*** [0.004]	0.013*** [0.004]	0.013*** [0.004]
Treatment: SOS _{BUS}	0.732*** [0.069]	-0.049 [0.086]	-0.033 [0.086]	-0.025 [0.070]	-0.009 [0.069]	0.074 [0.067]	0.038*** [0.006]	0.026*** [0.007]	0.026*** [0.007]	0.025*** [0.006]	0.025*** [0.006]	0.024*** [0.006]

Results for the fourth specification of the propensity score. The common support restriction is implemented by deleting the offshoring firms whose propensity score is higher than the maximum or lower than the minimum propensity score of the matched non-offshoring firms. NND = single nearest-neighbor without replacement, descending order. NNA = single nearest-neighbor without replacement, ascending order. NN10 = multiple nearest-neighbor with 10 matches. Radius = radius with 1% caliper. Kernel = epanechnikov kernel with 0.06 bandwidth. Analytical standard errors are reported in brackets. ***, **, *: indicate significance at 1, 5, and 10% level, respectively.

Table 7 - Adding Controls for Lagged Outcomes among the Conditioning Covariates

	a) Outcome: Log Employment				b) Outcome: Share of College Graduates			
	OLS	ATT			OLS	ATT		
		Model 1	Model 2	Model 3		Model 1	Model 2	Model 3
Treatment: SOS	0.577*** [0.050]	-0.061 [0.069]	0.012 [0.070]	-0.026 [0.093]	0.024*** [0.004]	0.014*** [0.005]	0.011* [0.006]	0.013* [0.007]
Treatment: SOS _{BUS}	0.732*** [0.069]	-0.024 [0.092]	-0.008 [0.093]	0.097 [0.110]	0.038*** [0.006]	0.035*** [0.007]	0.018** [0.008]	0.029*** [0.010]

Single nearest-neighbor matching with replacement. *Model 1* includes lagged (log) employment among the covariates of the fourth specification of the propensity score. *Model 2* further adds the lagged share of white-collar workers. *Models 3* also includes the lagged share of R&D workers. The common support restriction is implemented by deleting the offshoring firms whose propensity score is higher than the maximum or lower than the minimum propensity score of the matched non-offshoring firms. Analytical standard errors are reported in brackets. ***, **, *: indicate significance at 1, 5, and 10% level, respectively.

Table 8 - Sensitivity Analysis

	Outcome: a) Log Employment		b) Share of College Graduates	
	Treatment:		SOS	SOS _{BUS}
	SOS	SOS _{BUS}	SOS	SOS _{BUS}
<i>Confounder behaving like:</i>				
Log Output, 2002	0.019 [0.041]	0.049 [0.049]	0.010** [0.004]	0.021*** [0.005]
Log Average Wage, 2002	0.017 [0.041]	0.029 [0.051]	0.010*** [0.003]	0.020*** [0.005]
Log Value Added per Worker, 2002	0.018 [0.038]	0.021 [0.052]	0.011*** [0.003]	0.021*** [0.005]
Log Inputs per Worker, 2002	0.021 [0.042]	0.026 [0.052]	0.011*** [0.003]	0.021*** [0.005]
Log Capital per Worker, 2002	0.008 [0.038]	0.007 [0.047]	0.012*** [0.003]	0.023*** [0.005]
Share of Workers with Fixed-Term Contracts, 2002	0.013 [0.038]	0.006 [0.050]	0.012*** [0.003]	0.023*** [0.004]
Indicator: Quoted on the Stock Market	-0.006 [0.034]	-0.007 [0.041]	0.013*** [0.003]	0.025*** [0.004]
Indicator: Belongs to a Group	0.016 [0.039]	0.033 [0.054]	0.009** [0.004]	0.020*** [0.005]
Indicator: Credit Constrained	-0.003 [0.034]	-0.002 [0.041]	0.013*** [0.003]	0.025*** [0.004]
Share of Workers in Professional Training Courses, 2002	0.016 [0.039]	0.021 [0.053]	0.011*** [0.004]	0.022*** [0.005]
R&D / Sales, 2002	0.009 [0.039]	0.021 [0.055]	0.011*** [0.004]	0.021*** [0.005]
ICT Share of Total Investment, 2001-2003	0.010 [0.038]	0.008 [0.049]	0.012*** [0.003]	0.022*** [0.004]
Indicator: Foreign Direct Investment	0.002 [0.040]	0.002 [0.050]	0.012*** [0.004]	0.023*** [0.005]
Indicator: Participated by a Foreign Firm	0.008 [0.041]	0.026 [0.059]	0.011*** [0.004]	0.021*** [0.006]
Indicator: Exporter	0.014 [0.042]	0.021 [0.051]	0.010** [0.004]	0.022*** [0.005]
Indicator: Offshored Intermediate Inputs	0.013 [0.039]	0.018 [0.053]	0.012*** [0.003]	0.023*** [0.005]

Results for the fourth specification of the propensity score. The ATT's are based on 500 simulations of each confounder. The continuous covariates are discretized so that the observations above the sample mean take a value of 1. Analytical standard errors are reported in brackets. ***, **, *: indicate significance at 1, 5, and 10% level, respectively.