

Outsourcing, Offshoring and Innovation

Evidence from firm level data for emerging economies

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- The case of developed economies
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Introduction

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- Outsourcing is frequent practice among firms (Abramovsky and Griffith (2006))
- Effect of outsourcing on productivity (Görg et al. (2008), Hijzen et al. (2010)), but what are the exact channels?
- Fill part of the gap by studying the effects of outsourcing on innovative activities
- Novelty of our approach: focus on emerging economies (Central and Eastern European countries, CIS and Central Asian countries)

Literature Review

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 - Outsourcing as a means of strengthening core competencies by saving on factor costs and by restructuring operations towards higher value added activities
- Empirical studies on industrialized economies seem to confirm the theory (see Görg and Hanley (2011) for services outsourcing in Ireland, Cusmano et al. (2008) for Italy, Bloom et al. (2010) for 12 advanced European countries)

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- Evidence that imported inputs, in particular from industrialized countries, increase firms' technology level and productivity (Amiti and Konings (2007), Halpern et al. (2009), Kasahara and Rodrigue (2008))
 - Cost reduction
 - Learning effects, variety and quality effects through sourcing from more advanced economies

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 - Learning effects, variety and quality effects through sourcing from more advanced economies
 - Scope for positive innovation effects larger with offshoring than with outsourcing
- We also investigate country characteristics, namely the level of competition and the protection of intellectual property, as well as competition on the firm-level .

The BEEPS dataset

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- Country data on local competition and the degree of intellectual property rights protection from the Global Competitiveness Report (2008)

Econometric specification

Model

$$Prob(Inno_{it}) = \alpha + \beta outsourcing_{it} + \gamma offshoring_{it} + \lambda controlvar_{it} + \varepsilon_{it} \quad (1)$$

- Innovation is alternatively defined as new product innovation or upgrading.
- Regressions include industry, country and time dummies.

Identification strategy

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 - Dummy whether material inputs could be paid after delivery
 - Use of e-mail to communicate with customers and suppliers
 - Dummy whether the firm applied for an import license
 - Extent to which tax regulation is an obstacle to the company

Descriptive statistics

Table: Descriptives: Outsourcing vs. non-outsourcing

Outsourcing	No			Yes		
Variable	Obs.	Mean	Std. dev.	Obs.	Mean	Std. dev.
New product	874	0.501	0.500	288	0.663	0.473
Upgrading	874	0.644	0.479	289	0.817	0.387
Offshoring	874	0	0	289	0.432	0.496
Imports	874	34.052	37.368	289	38.394	36.336
Exports	874	14.543	27.479	289	20.907	30.275
RD	874	0.246	0.431	289	0.450	0.498
Joint Venture	874	0.043	0.204	289	0.041	0.199
Finance	874	0.243	0.429	289	0.252	0.435
University	874	19.826	22.610	289	20.432	21.215
Size	874	1.916	0.804	289	2.207	0.762

Source: BEEPS

Descriptive statistics

Table: Descriptives: Offshoring vs. non-offshoring

Offshoring	No			Yes		
Variable	Obs.	Mean	Std. dev.	Obs.	Mean	Std. dev.
New product	1037	0.515	0.500	125	0.760	0.429
Upgrading	1038	0.668	0.471	125	0.848	0.360
Outsourcing	1038	0.158	0.365	125	1	0
Imports	1038	32.906	36.957	125	53.616	33.513
Exports	1038	15.522	27.949	125	21.128	30.906
RD	1038	0.267	0.443	125	0.544	0.500
Joint Venture	1038	0.042	0.202	125	0.048	0.215
Finance	1038	0.243	0.429	125	0.272	0.447
University	1038	20.219	22.600	125	17.968	19.211
Size	1038	1.966	0.806	125	2.176	0.763

Source: BEEPS

Baseline estimation

Table: Exogenous outsourcing and offshoring

	New product LPM	New product LPM	New product Probit	Upgrading LPM	Upgrading LPM	Upgrading Probit
Outsourcing	0.027 (0.042)	0.039 (0.042)	0.038 (0.047)	0.067* (0.035)	0.077** (0.035)	0.093** (0.038)
Offshoring	0.123** (0.054)	0.089 (0.055)	0.113* (0.065)	0.025 (0.047)	-0.002 (0.048)	-0.008 (0.065)
Imports		0.001*** (0.000)	0.001*** (0.000)		0.001*** (0.000)	0.001*** (0.001)
Exports	0.000 (0.001)	0.000 (0.001)	0.000 (0.001)	0.001 (0.001)	0.001 (0.001)	0.001 (0.001)
Finance	0.017 (0.033)	0.014 (0.033)	0.024 (0.039)	0.002 (0.030)	-0.000 (0.030)	-0.004 (0.033)
RD	0.272*** (0.031)	0.262*** (0.031)	0.292*** (0.033)	0.201*** (0.028)	0.193*** (0.028)	0.219*** (0.028)
Joint venture	0.162** (0.068)	0.135** (0.068)	0.170** (0.077)	0.055 (0.061)	0.034 (0.062)	0.055 (0.070)
University	0.002*** (0.001)	0.002*** (0.001)	0.002** (0.000)	0.002*** (0.001)	0.002*** (0.001)	0.002*** (0.001)
Size1	0.092** (0.036)	0.090** (0.036)	0.106*** (0.040)	0.118*** (0.034)	0.116*** (0.034)	0.120*** (0.033)
Size2	0.016 (0.040)	0.007 (0.040)	0.013 (0.046)	0.089** (0.037)	0.082** (0.037)	0.087** (0.037)
Observations	1165	1165	1163	1165	1165	1163
R squared	0.2013	0.2081	0.1670	0.1995	0.2045	0.1852

Clustered standard errors in parentheses. Industry, country and time dummies included.

* 10% significance, ** 5% significance, *** 1% significance.

IV implementation

Table: Endogenous outsourcing and offshoring

	New product LPM	New product Probit	Upgrading LPM	Upgrading Probit
Outsourcing	0.767*** (0.248)	2.354*** (0.796)	0.605*** (0.230)	2.152** (0.855)
Offshoring	-0.372 (0.690)	-1.224 (2.102)	-0.779 (0.619)	-2.805 (2.250)
Imports	0.002* (0.001)	0.006* (0.004)	0.002* (0.001)	0.009* (0.005)
Finance	0.014 (0.037)	0.067 (0.116)	0.006 (0.035)	0.033 (0.136)
RD	0.222*** (0.067)	0.673*** (0.200)	0.236*** (0.062)	0.953*** (0.219)
Joint venture	0.143* (0.080)	0.478* (0.266)	0.075 (0.073)	0.399 (0.323)
University	0.000 (0.001)	0.001 (0.003)	0.001 (0.001)	0.004 (0.004)
Size1	0.027 (0.043)	0.088 (0.131)	0.084* (0.044)	0.296* (0.151)
Size2	-0.074 (0.047)	-0.215 (0.144)	0.082** (0.044)	-0.026 (0.158)
F test - outsourcing	11.42		11.33	
F test - offshoring	3.12		2.34	
Underidentification (p-value)	0.0200		0.0728	
Hansen J test (p-value)	0.2367		0.2227	
Exogeneity test (p-value)	0.0010	0.0007	0.0494	0.0480
Observations	1189	1187	973	932

Clustered standard errors in parentheses. Industry, country and time dummies included.

IV implementation

Table: First stage regression results for excluded instruments from linear probability model

	New product offshoring	New product outsourcing	Upgrading offshoring	Upgrading outsourcing
Labor regulation	0.018** (0.009)	0.038*** (0.012)		
Email	-0.003 (0.022)	0.058* (0.033)	0.015 (0.026)	0.086** (0.037)
Customers pressure	-0.009 (0.009)	0.037*** (0.013)	-0.008 (0.011)	0.045*** (0.015)
Payments after delivery	0.047*** (0.018)	0.096*** (0.030)		
Tax regulation			0.037* (0.021)	0.087*** (0.029)
Import license			0.010** (0.043)	0.199*** (0.053)
F-test joint significance	3.12	11.42	2.34	11.33
Observations	1189	1189	973	973
R squared	0.0840	0.0918	0.0898	0.0866

Clustered standard errors in parentheses. Industry, country and time dummies included.

* 10% significance, ** 5% significance, *** 1% significance.

IV implementation

Table: Country-level competition: endogenous outsourcing

Dependent var: New product	High competition	Low competition
Outsourcing	0.886*** (0.294)	0.634** (0.305)
Imports	0.001** (0.001)	0.001** (0.000)
Finance	0.027 (0.046)	0.004 (0.042)
RD	0.147** (0.059)	0.180*** (0.061)
Joint venture	0.124 (0.137)	0.098 (0.085)
University	0.001 (0.001)	0.001* (0.001)
Size1	0.078* (0.045)	0.089** (0.044)
Size2	-0.044 (0.054)	0.043 (0.053)
F test - outsourcing	7.22	7.13
Underidentification (p-value)	0.0001	0.0001
Hansen J test (p-value)	0.1123	0.1193
Exogeneity test (p-value)	0.0016	0.0395
Observations	996	974

Clustered standard errors in parentheses. Industry, country and time dummies included.

* 10% significance, ** 5% significance, *** 1% significance. Instruments used: labor regulation, email and payments after delivery

IV implementation

Table: Firm-level competition: endogenous outsourcing

Dependent var: New product	High competition	Low competition
Outsourcing	0.849*** (0.324)	0.517 (0.394)
Imports	0.000 (0.001)	0.001 (0.001)
Finance	0.003 (0.050)	-0.063 (0.085)
RD	0.207*** (0.061)	0.153 (0.101)
Joint venture	0.086 (0.118)	0.244** (0.124)
University	-0.000 (0.002)	0.003* (0.002)
Size1	-0.017 (0.069)	0.058 (0.084)
Size2	-0.063 (0.068)	-0.076 (0.096)
F test - outsourcing	7.82	4.17
Underidentification (p-value)	0.0005	0.0079
Hansen J test (p-value)	0.0986	0.9293
Exogeneity test (p-value)	0.0026	0.1909
Observations	691	296

Clustered standard errors in parentheses. Industry, country and time dummies included.

* 10% significance, ** 5% significance, *** 1% significance. Instruments used: labor regulation, customers pressure and payments after delivery

IV implementation

Table: IPR protection: endogenous outsourcing

Dependent var: New product	High IPR protection	Low IPR protection
Outsourcing	0.851*** (0.311)	0.606** (0.236)
Imports	0.001 (0.001)	0.001** (0.000)
Finance	0.039 (0.045)	0.002 (0.041)
RD	0.110* (0.060)	0.207*** (0.050)
Joint venture	0.030 (0.132)	0.104 (0.078)
University	0.002 (0.001)	0.001 (0.001)
Size1	0.074 (0.048)	0.092** (0.039)
Size2	0.048 (0.059)	-0.020 (0.047)
F test - outsourcing	6.31	10.54
Underidentification (p-value)	0.0004	0.0003
Hansen J test (p-value)	0.2512	0.0886
Exogeneity test (p-value)	0.0048	0.0080
Observations	736	1198

Clustered standard errors in parentheses. Industry, country and time dummies included.

* 10% significance, ** 5% significance, *** 1% significance. Instruments used: labor regulation, customers pressure and payments after delivery

Conclusion

- Positive effect of outsourcing on innovation, most pronounced for the introduction of new products
- No differences between outsourcing and offshoring

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- Positive effect of outsourcing on innovation, most pronounced for the introduction of new products
- No differences between outsourcing and offshoring
- Policy relevance: IPR protection and - to a smaller extent - competitive pressure matter when firms try to reap the benefits of outsourcing

Appendix I

Table: Description of variables

Variable	Description of the variable
Newproduct	Has this establishment introduced new products or services in the last 3 years?*
Upgradproduct	Has this establishment upgraded an existing product line or service in the last 3 years?*
Offshoring	change in % of material inputs and supplies of foreign origin in the fiscal year 04/07 (01/04) combined with outsourcing*
Outsourcing	Has this establishment outsourced activities previously done in-house in the last three years?*
Imports	% of material inputs and supplies of foreign origin in the last fiscal year
R&D	Has this establishment invested in R&D (in-house or outsourced) in the last 3 years?*
University	% of employees at the end of 2007 with a university degree
Joint Venture	How was this firm established? Joint venture with foreign partner(s)*
Finance	Is access to finance, which includes availability and cost, interest rates, fees and collateral requirements an obstacle to the current operations of this establishment? 0 (no obstacle) - 4 (very severe obstacle)
Exports	Did this firm export, either directly or indirectly, in the last fiscal year?
Size	small (5-19 employees), medium (20-99) and large (100 and more)***

Note:

* 1 = yes and 0 = no

** scaled 1-4; 1 being the least important

*** scale 1-3

Appendix

Table: Description of variables

Variable	Description of the variable
Instruments	
E-mail	Do you currently communicate with clients and suppliers by e-mail?*
Customers	How important is pressure from customers in affecting decisions to develop new products or services and markets?*
Payments after delivery	In the last fiscal year, did this establishment purchase any material inputs or services and pay for them after delivery (on credit)?*
Labor regulations	Are labor regulations an obstacle to the current operations of this establishment? 0 (no obstacle) - 4 (very severe obstacle)
Import license	Over the last two years, did this establishment submit an application to obtain an import license?*
Tax regulation	Are tax rates an obstacle to the current operations of this establishment? 0 (no obstacle) - 4 (very severe obstacle)

Note:

* 1 = yes and 0 = no

** scaled 1-4; 1 being the least important

Appendix

Country	Number	Per cent
Albania	13	1.12
Belarus	19	1.63
Georgia	32	2.75
Tajikistan	29	2.49
Turkey	296	25.41
Ukraine	39	3.35
Uzbekistan	42	3.61
Russia	16	1.37
Poland	30	2.58
Romania	45	3.86
Serbia	54	4.64
Kazakhstan	38	3.26
Moldova	77	6.61
Bosnia and Herzegovina	26	2.23
Azerbaijan	45	3.86
FYROM	47	4.03
Armenia	61	5.24
Kyrgyz Republic	31	2.66
Estonia	23	1.97
Czech Republic	10	0.86
Hungary	27	2.32
Latvia	19	1.63
Lithuania	13	1.12
Slovakia	14	1.20
Slovenia	40	3.43
Bulgaria	55	4.72
Croatia	22	1.89
Montenegro	2	0.17
Total	1,165	100.00

Appendix

Table: Country classification: Local competition

High competition	Low competition
Czech Republic	Romania
Slovakia	Azerbaijan
Estonia	Mongolia
Hungary	Montenegro
Lithuania	Bosnia and Herzegovina
Poland	Kazakhstan
Turkey	FYROM
Latvia	Russia
Moldova	Ukraine
Slovenia	Tajikistan
Bulgaria	Georgia
Croatia	Kyrgyz Republic
	Albania
	Serbia
	Armenia

Countries are sorted by their degree of local competition, i.e. the Czech Republic is the country with the higher level of local competition and Armenia has the lowest level of local competition.

Appendix

Table: Country classification: Intellectual property rights protection

High protection	Low protection
Estonia	Turkey
Slovenia	Bulgaria
Hungary	Russia
Lithuania	Tajikistan
Czech Republic	FYROM
Slovakia	Georgia
Croatia	Serbia
Latvia	Ukraine
Moldova	Kyrgyz Republic
Romania	Armenia
Azerbaijan	Mongolia
Poland	Albania
Montenegro	Bosnia and Herzegovina
Kazakhstan	

Countries are sorted by their degree of protection of intellectual property, i.e. Estonia is the country with the higher level of protection and Bosnia has the lowest level of protection.

References I

- Abramovsky, Laura and Rachel Griffith**, “Outsourcing and Offshoring of Business Services: How Important is ICT?,” *Journal of the European Economic Association*, 2006, 4, 594–601.
- Amiti, Mary and Jozef Konings**, “Trade Liberalization, Intermediate Inputs and Productivity: Evidence from Indonesia,” *American Economic Review*, 2007, 97 (5), 1611–1638.
- Bloom, Nicholas, Mirko Draca, and John Van Reenen**, “Trade Induced Technical Change? The Impact of Chinese Imports on Innovation, IT and Productivity,” NBER Working Papers Series 16717, NBER 2010.
- Cusmano, Lucia, Maria Luisa Mancasi, and Andrea Morrison**, “Innovation and the Geographical and Functional Dimensions of Outsourcing: An Empirical Investigation Based on Italian Firm Level Data,” *Structural Change and Economic Dynamics*, 2008, 20 (3), 183–195.
- Glass, Amy Jocelyn and Kamal Saggi**, “Innovation and Wage Effects of International Outsourcing,” *European Economic Review*, 2001, 45 (1), 67–86.
- Görg, Holger and Aoife Hanley**, “Services Outsourcing and Innovation: An Empirical Investigation,” *Economic Inquiry*, 2011, 49 (2), 321–333.
- , —, and **Eric Strobl**, “Productivity Effects of International Outsourcing: Evidence from Plant Level Data,” *Canadian Journal of Economics*, 2008, 41, 670–688.

References II

- Halpern, Lazlo, Miklos Koren, and Adam Szeidl**, “Imports and Productivity,” CeFiG Working Papers No. 8, Center for Firms in the Global Economy 2009.
- Hijzen, Alexander, Tomohiko Inui, and Yasuyuki Todo**, “Does Offshoring Pay? Firm-level Evidence from Japan,” *Economic Inquiry*, 2010, 48 (4), 880–895.
- Kasahara, Hiroyuki and Joel Rodrigue**, “Does the Use of Imported Intermediates Increase Productivity?,” *Journal of Development Economics*, 2008, 87 (1), 106–118.
- Miroudot, Sebastien, Rainer Lanz, and Alexandros Ragoussis**, “Trade in Intermediate Goods and Services,” OECD Trade Policy Working Papers 93, OECD 2009.