

FDI Promotion and Comparative Advantage

Torfinn Harding
University of Sussex

Beata S. Javorcik
University of Oxford and CEPR

Daniela Maggioni
Universit Politecnica delle Marche

- The composition of trade matters for development (Hausmann et al., 2007)
- Comparative advantage determined by geography, factor endowments, technology and institutions
- Can governments shape their country's comparative advantage through industrial policy?

- **Can developing countries affect their comparative advantage through FDI promotion policies?**
 - Foreign direct investment is a channel of technology transfer across international borders
 - FDI may provide information about what a country can be good at producing (Hausmann and Rodrik, 2003)
 - FDI promotion policy is an effective and inexpensive tool (Harding and Javorcik 2011, 2013)
 - FDI promotion policies help developing countries upgrade the quality of exports (Harding and Javorcik 2012)

What is investment promotion?

- Functions of investment promotion agencies
 - Image building
 - Investment generation
 - Investor servicing
 - Policy advocacy
- Investment promotion is effective
 - in developing countries
 - when greater information asymmetries are present
 - in countries with more difficult business climate

How does it work?

- Direct effect of FDI inflows (ie exports of foreign affiliates)
 - Intel in Costa Rica
 - Volkswagen in Slovakia
- Indirect effects
 - Local firms more likely to export if exposed to exporting foreign affiliates (Aitken et al., 1997)
 - Productivity spillovers boost the ability of domestic firms to export

Preview of the results

- Sectors targeted by investment promotion agencies see an increase in their RCA
- Effect mostly visible in the intensive margin
- Higher values of exports found across the distribution of exporters

- **Identification**

- take advantage of country-sector-time varying information on FDI promotion efforts
- difference-in-differences approach

- **Outcome of interest**

- revealed comparative advantage defined at the country-product level
- export value

- **Channels**

- focus on detailed indicators constructed from transaction level data by the World Bank

Focus on developing countries since

- FDI more likely to make a difference in developing countries, as there is a technology gap to fill
- FDI promotion policies are effective only in developing countries (Harding and Javorcik, 2011)
- Data set on export micro structure available only for developing countries

- Efforts by investment promotion agencies (IPA) recorded in the 2005 World Bank Census and available at 3-digit 1997-NAICS sector level
- Trade flows from COMTRADE at 4-digit SITC-level: focusing on values of exports
- Exporter Dynamic Database recently released by the World Bank
- Sample: 73 low and medium income countries 1984-2006

$$RCA_{cpt} = \alpha + \beta Targ_{cst} + Z'_{ct}\theta + \delta_{pt} + \eta_{cp} + \epsilon_{cpt} \quad (1)$$

- c denotes exporting country, p 4-digit SITC product, s NAICS sector and t year
- $RCA_{cpt} = \frac{X_{cpt}/X_{ct}}{X_{pt}^{World}/X_t^{World}}$, (Balassa, 1965)
- $Targ = 1$ if country-sector targeted in year t , 0 otherwise
- Focus only on exported products, we will deal with 0s in robustness checks
- Standard errors clustered at country-sector level

Alternative regression model

$$\ln X_{cpt} = \alpha + \beta Targ_{cst} + \gamma_{ct} + \delta_{pt} + \eta_{cp} + \epsilon_{cpt} \quad (2)$$

- $\ln X_{cpt}$ as dependent variable to deal with non-linearity of RCA
- Changes in $\ln X_{cpt}$ conditional on γ_{ct} and δ_{pt} interpreted as changes in $\ln RCA$

Baseline results

	Dependent variable: RCA index		
	(1)	(2)	(3)
$Targ_t$	0.120** [0.053]		
$Targ_{t-1}$		0.142*** [0.051]	
$Targ_{t-2}$			0.150*** [0.052]
$GDPpc_{t-1}$	-0.213* [0.129]	-0.232* [0.126]	-0.241* [0.124]
Pop_t	-0.184 [0.305]	-0.223 [0.297]	-0.259 [0.291]
$Infl_t$	0.000 [0.000]	0.000 [0.000]	0.000 [0.000]
Country-Product FE	YES	YES	YES
Product-Time FE	YES	YES	YES
Obs.	457,145	487,474	517,709
R^2	0.645	0.639	0.634

Baseline results

Dependent variable: $\log(X_{cpt})$

VARIABLES	(1)	(2)	(3)
$Targ_t$	0.099* [0.051]		
$Targ_{t-1}$		0.102** [0.051]	
$Targ_{t-2}$			0.116** [0.051]
Country-Product	YES	YES	YES
Product-Time	YES	YES	YES
Country-Time	YES	YES	YES
Observations	457,145	487,474	517,709
R-squared	0.834	0.833	0.832

Targeted country-sectors improve their comparative advantage by

- 10-12%
- 3-4% of the standard deviation in the RCA index

Econometric challenges I: Is targeting exogenous?

- 1 Product-time varying unobservable factors (global demand and supply shocks)
- 2 Country-product specific unobservable factors (e.g. geography)
- 3 Country-time varying unobservable factors (e.g. country-wide reforms)
- 4 Some additional information
- 5 Strict exogeneity test

Note: 1-3 deals with omitted variable bias, 5 deals with simultaneity

How the agency measures its performance?

- Amount of FDI inflows 73.3%
- No. of jobs created through FDI inflows 68.6%
- Foreign investor satisfaction with the agency's services 64.0%
- No. of prospective investors contacted 61.6%
- Policy advocacy efforts 55.8%
- No. of investment missions abroad 45.4%
- Improvements in the country's image abroad 40.7%
- **Impact of FDI in exports 1.2%**

Does past RCA determine the choice of priority sectors?

Dependent Variable	Targ _{sct}								
"Predictor:"	RCA dummy sector level			RCA index sector level			Weighted ave. of RCA index across products		
RCA ^{dum} _{t-1}	0.006 [0.009]								
RCA ^{dum} _{t-2}	0.005 [0.009]								
RCA ^{dum} _{t-3}	0.006 [0.010]								
RCA _{t-1}				0.002 [0.003]			0.000 [0.001]		
RCA _{t-2}				0.002 [0.003]			0.000 [0.001]		
RCA _{t-3}				0.003 [0.003]			0.001 [0.001]		
GDP _{pc,t-1}	0.065*** [0.025]	0.082*** [0.027]	0.095*** [0.029]	0.062** [0.025]	0.078*** [0.027]	0.090*** [0.029]	0.065*** [0.025]	0.082*** [0.027]	0.094*** [0.029]
Pop _t	0.284*** [0.090]	0.334*** [0.094]	0.388*** [0.099]	0.279*** [0.091]	0.334*** [0.095]	0.389*** [0.100]	0.285*** [0.090]	0.336*** [0.094]	0.391*** [0.099]
Infl _t	0.000*** [0.000]	0.000*** [0.000]	0.000*** [0.000]	0.000*** [0.000]	0.000*** [0.000]	0.000*** [0.000]	0.000*** [0.000]	0.000*** [0.000]	0.000*** [0.000]
Country-Sector	YES	YES	YES	YES	YES	YES	YES	YES	YES
Sector-Year	YES	YES	YES	YES	YES	YES	YES	YES	YES
Obs.	23,119	21,912	20,706	22,621	21,429	20,236	23,091	21,883	20,678
R ²	0.566	0.589	0.606	0.565	0.588	0.605	0.566	0.589	0.605

Strict Exogeneity Test

	RCA index			$\ln(X_{cpt})$		
Targ _t	0.069 [0.053]	-0.03 [0.038]	-0.03 [0.038]	0.137*** [0.050]	0.063* [0.038]	0.063* [0.038]
Targ _{t-1}		0.129** [0.054]	0.081** [0.037]		0.097* [0.054]	-0.015 [0.037]
Targ _{t-2}			0.064 [0.062]			0.148*** [0.053]
Targ _{t+1}	0.051 [0.048]	0.053 [0.048]	0.054 [0.048]	-0.014 [0.044]	-0.012 [0.043]	-0.008 [0.044]
GDPpc _{t-1}	-0.175 [0.132]	-0.176 [0.132]	-0.177 [0.132]			
Pop _t	-0.09 [0.311]	-0.104 [0.312]	-0.11 [0.312]			
Infl _t	0.000 [0.000]	0.000 [0.000]	0.000 [0.000]			
Product-Time	YES	YES	YES	YES	YES	YES
Country-Product	YES	YES	YES	YES	YES	YES
Country-Time				YES	YES	YES
Obs.	427,237	427,237	427,237	427,237	427,237	427,237
R ²	0.651	0.651	0.651	0.834	0.834	0.834

Controlling for potential drivers of comparative advantage

	Dependent variable: RCA index				
	(1)	(2)	(3)	(4)	(5)
Targ _t	0.157*** [0.061]	0.121** [0.052]	0.158*** [0.056]	0.135*** [0.052]	0.172** [0.068]
Skill_End _{t-1} *Skill_Int _{t-1}	6.115** [2.686]				3.931* [2.253]
Skill_End _{t-1}	-1.572 [0.964]				-1.584** [0.799]
Cap_End _{t-1} *Cap_Int _{t-1}		0.000 [0.005]			-0.009 [0.006]
Cap_End _{t-1}		0.001 [0.021]			0.04 [0.026]
Inst.Qual _{t-1} *Inst.Dep _{t-1}			-0.151 [0.274]		-0.154 [0.295]
Inst.Qual _{t-1}			0.101 [0.256]		0.111 [0.276]
Fin.Dev _{t-1} *Fin.Dep _{t-1}				1.012*** [0.326]	1.313*** [0.445]
Fin.Dev _{t-1}				-0.583*** [0.161]	-0.678*** [0.221]
GDPpc _{t-1}	-0.284** [0.143]	-0.244* [0.141]	-0.323** [0.155]	-0.262* [0.139]	-0.231 [0.182]
Pop _t	-0.313 [0.310]	-0.238 [0.309]	-0.551 [0.367]	-0.469 [0.343]	-0.745* [0.432]
Infl _t	0.000 [0.000]	0.000 [0.000]	0.000 [0.000]	0.000** [0.000]	0.000 [0.000]
Obs.	336,837	449,862	370,242	433,448	270,548
R ²	0.664	0.646	0.674	0.665	0.695

Selection and heteroscedasticity issues

- 1 Treating them as zeros and estimating with either *Tobit* or *Poisson* estimators
- 2 Aggregating to country-sector level

Treating missing flows as zeros: Panel Tobit

Dependent variable: RCA index, including missing flows

	(1)	(2)	(3)
<i>Targ_t</i>	0.387*** [0.108]		
<i>Targ_{t-1}</i>		0.446*** [0.112]	
<i>Targ_{t-2}</i>			0.402*** [0.112]
<i>GDPpc_{t-1}</i>	-1.256*** [0.167]	-1.264*** [0.167]	-1.263*** [0.166]
<i>Pop_t</i>	1.515*** [0.484]	1.495*** [0.483]	1.473*** [0.478]
<i>Infl_t</i>	0 [0.000]	0 [0.000]	0 [0.000]
Country-Product	YES	YES	YES
Time	YES	YES	YES
Observations	792,187	792,187	792,187

Including missing flows: Panel Tobit

	Dependent variable: $\ln(\text{Exports} + 1)$					
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Target</i>	0.353*** [0.022]	0.262*** [0.022]				
<i>Target-1</i>			0.346*** [0.022]	0.262*** [0.021]		
<i>Target-2</i>					0.328*** [0.021]	0.247*** [0.021]
<i>GDPpc_{t-1}</i>		0.067* [0.037]		0.132*** [0.036]		0.226*** [0.036]
<i>Pop_t</i>		-0.863*** [0.106]		-0.734*** [0.102]		-0.622*** [0.098]
<i>Infl_t</i>		-0.000*** [0.000]		-0.000*** [0.000]		-0.000*** [0.000]
Country-Product	YES	YES	YES	YES	YES	YES
Time	YES	YES	YES	YES	YES	YES
Observations	878,773	798,178	922,473	840,027	966,039	881,780

Poisson regressions with panel FE

Dependent variable: RCA index, positive flows

	(1)	(2)	(3)
<i>Targ_t</i>	0.105*** [0.038]		
<i>Targ_{t-1}</i>		0.122*** [0.039]	
<i>Targ_{t-2}</i>			0.119*** [0.043]
<i>GDPpc_{t-1}</i>	-0.181* [0.096]	-0.183* [0.096]	-0.183* [0.096]
<i>Pop_t</i>	-0.026 [0.226]	-0.033 [0.226]	-0.035 [0.227]
<i>Infl_t</i>	0.002* [0.001]	0.002* [0.001]	0.002* [0.001]
Country-Product	YES	YES	YES
Time	YES	YES	YES
Observations	454,240	454,240	454,240
Number of cp	37,374	37,374	37,374
LL	-415403.822	-415367.194	-415394.283
Chi2	140.375	141.919	138.835
Pchi2	0	0	0

Poisson regressions with panel FE

Dependent variable: RCA index, all flows (including zeros)

	(1)	(2)	(3)
<i>Targ_t</i>	0.089** [0.041]		
<i>Targ_{t-1}</i>		0.105** [0.042]	
<i>Targ_{t-2}</i>			0.098** [0.046]
<i>GDPpc_{t-1}</i>	-0.374*** [0.095]	-0.375*** [0.095]	-0.375*** [0.095]
<i>Pop_t</i>	0.407* [0.230]	0.402* [0.230]	0.402* [0.230]
<i>Infl_t</i>	-0.001 [0.002]	-0.001 [0.002]	-0.001 [0.002]
Country-Product	YES	YES	YES
Time	YES	YES	YES
Observations	728,086	728,086	728,086
Number of cp	40,262	40,262	40,262
LL	-548568.819	-548538.514	-548567.562
Chi2	288.532	288.627	287.617
Pchi2	0	0	0

Aggregating exports to the sector level

	(1)	(2)	(3)	(4)	(5)	(6)
	ln(Exports) positive flows			ln(Exports + 1) including zeros		
<i>Targ_t</i>	0.108** [0.050]			0.089* [0.052]		
<i>Targ_{t-1}</i>		0.107** [0.049]			0.097* [0.051]	
<i>Targ_{t-2}</i>			0.098** [0.049]			0.081 [0.050]
Country-Sector	YES	YES	YES	YES	YES	YES
Sector-Time	YES	YES	YES	YES	YES	YES
Country-Time	YES	YES	YES	YES	YES	YES
Observations	26,638	28,030	29,420	27,221	28,622	30,023
R-squared	0.918	0.918	0.918	0.919	0.918	0.918

$$\Delta_{t+\tau,t-1} \ln(RCA_{cp}) = \beta \Delta_{t+\tau,t-1} Targ_{cst} + \delta_p + \eta_c + \epsilon_{cp}, \tau = 1, \dots, 6 \quad (3)$$

- $\Delta_{t+\tau,t-1} \ln(RCA_{cp})$ is the RCA change for product p in country c between each post-targeting period ($t + 1, \dots, t + 6$) and the pre-targeting year
- $\Delta_{t+\tau,t-1} Targ$ is the change in the sector targeting practice indicator between the period $t - 1$ and $t + \tau$
- δ_p and η_c denote product and country fixed effects respectively
- t is the year when IPAs start targeting sectors, which differs across countries

Cross section of time-differences

	$\ln(RCA), RCA > 0$					
	$\Delta_{t+1/t-1}$	$\Delta_{t+2/t-1}$	$\Delta_{t+3/t-1}$	$\Delta_{t+4/t-1}$	$\Delta_{t+5/t-1}$	$\Delta_{t+6/t-1}$
<i>Targ</i> in <i>t</i>	0.049 [0.052]	0.137** [0.066]	0.274*** [0.073]	0.184** [0.076]	0.204** [0.091]	0.240*** [0.087]
Country	YES	YES	YES	YES	YES	YES
Product	YES	YES	YES	YES	YES	YES
Obs.	8,064	8,139	7,450	6,731	5,694	5,222
R ²	0.125	0.135	0.171	0.198	0.22	0.253

	$\ln(X_{cpt}), X_{cpt} > 0$					
	$\Delta_{t+1/t-1}$	$\Delta_{t+2/t-1}$	$\Delta_{t+3/t-1}$	$\Delta_{t+4/t-1}$	$\Delta_{t+5/t-1}$	$\Delta_{t+6/t-1}$
<i>Targ</i> in <i>t</i>	0.042 [0.052]	0.137** [0.066]	0.279*** [0.072]	0.192*** [0.071]	0.214** [0.087]	0.226*** [0.087]
Country	YES	YES	YES	YES	YES	YES
Product	YES	YES	YES	YES	YES	YES
Observations	8064	8139	7450	6731	5694	5222
R ²	0.144	0.139	0.167	0.178	0.222	0.232

Which firms improve their exports performance in the presence of FDI?

- Evidence on productivity spillovers from FDI, particularly through backward linkages
- Exports performance of Chinese firms is positively associated with foreign presence (Swenson and Chen, 2012)

Channels: the underlying micro dynamics

Exporter Dynamics Database (EDD) from the World Bank

- Export value per exporter
- Number of Destinations per Exporter by HS-product
- Share of Top 25% Exporters by HS-product
- Average and median export unit value of exporters selling a given HS-product

Channels: the underlying micro dynamics

$$ExpDyn_{c\tilde{p}t} = \alpha + \beta Targ_{cst} + Z'_{ct}\gamma + \delta_{\tilde{p}t} + \eta_{c\tilde{p}} + \epsilon_{c\tilde{p}t} \quad (4)$$

- where $ExpDyn_{c\tilde{p}t}$ are the exporters' characteristics and micro export margins mentioned above
- \tilde{p} denotes a 6-digit HS code (different from the previous analysis)
- $Targ$ and Z_{ct} , are defined as before
- We control for country-product and product-year fixed effects

Channels: the underlying micro dynamics

Dependent variable: Export value per exporter in a given HS-product

	Mean			Median			25 th percentile			75 th percentile		
Targ _t	0.008 [0.060]			-0.025 [0.134]			-0.016 [0.205]			-0.023 [0.102]		
Targ _{t-1}	0.130*** [0.044]			0.293*** [0.104]			0.427*** [0.148]			0.216*** [0.079]		
Targ _{t-2}	0.105*** [0.037]			0.279*** [0.083]			0.444*** [0.116]			0.196*** [0.066]		
Obs.	102,068	129,820	162,883	102,068	129,820	162,883	102,068	129,820	162,883	102,068	129,820	162,883
R ²	0.921	0.905	0.893	0.862	0.837	0.824	0.813	0.779	0.762	0.874	0.85	0.837

Channels: the underlying micro dynamics

	# of Destinations per Exporter						Share of Top 25% Exporters		
	Mean			Median					
Targ _t	-0.012 [0.016]			-0.007 [0.011]			0.004 [0.006]		
Targ _{t-1}		0.042*** [0.015]			0.014** [0.006]			-0.016*** [0.005]	
Targ _{t-2}			0.056*** [0.013]			0.018*** [0.005]			-0.021*** [0.005]
Obs.	102,068	129,820	162,883	102,068	129,820	162,883	70,048	89,409	112,498
R ²	0.891	0.865	0.851	0.762	0.726	0.703	0.809	0.773	0.757

Channels: the underlying micro dynamics

Dependent variables: average and median export unit value of exporters selling a given HS-product

	Mean			Median		
Targ _t	0.136*** [0.035]			0.193*** [0.035]		
Targ _{t-1}		0.175*** [0.026]			0.232*** [0.035]	
Targ _{t-2}			0.108*** [0.028]			0.120*** [0.030]
Obs.	63,385	78,897	99,564	63,385	78,897	99,564
R ²	0.934	0.926	0.923	0.939	0.931	0.927

- Targeting a sector increases the RCA of the corresponding products by about 10-12%
- Exporters in targeted sectors, relative to non-targeted sectors, expand their activity in foreign markets by
 - enlarging the value of traded goods
 - reaching a larger number of export destinations
 - increase the quality of exports
- These positive effects are not restricted to larger firms, all firms regardless of their size seem to be affected

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