EU Enlargement, Economic Interdependence and the Labor Markets in 'Old' and 'New' Member States

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Prin 2007
PUE◯PIEC

Politiche dell'Unione Europea,
processi di integrazione economica
e commerciale ed esiti
del negoziato Wto

The facts

- **european integration widening** in the 1990s involves ex-communist (relatively) low labor cost countries in trade relations with EU-15 countries
- **outward processing trade** boosted (Baldone et al., 2001; de Benedictis and Tajoli, 2008)
- **dynamic changes in employment levels and composition in CEECs** (periods of high unemployment, structural change, quality upgrading of employment structures?)

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- *models with one final good*:
  low skilled labor easily subsitutable by foreign workers from low labor cost locations; foreign **high skilled labor rather a complement** for domestic skilled workers (Feenstra and Hanson, 1996, 1999, 2003)

- *models with two final goods*:
  fragmentation of production process - labor intensive parts of production done abroad in labor abundand countries (Arndt, 1997);
  low skilled labor needs not to be a loser from globalisation (Grossman&Rossi-Hansberg, 2006)

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Labor market effects of European integration

Empirical evidence so far:
Usually country specific studies (focused on the effects of OPT/intermediate inputs trade)

- **Old Members (EU-15)**:
  - in general offshoring and OPT positively affect the relative demand for skilled labor in EU-15
  - Austria: Egger&Egger (2003, 2005); Italy and Germany: Helg&Tajoli (2005); Germany: Geischecker (2006)

- **New Members**:
  - σ convergence of average wages among CEECs but negative impact of intermediate goods trade on skilled/unskilled wage bill ratio
  - Egger&Egger (2002), Egger (2006), Egger&Stehrer (2003): few CEECs

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- **'Old' and 'New'** EU members at same time
- **beyond manufacturing** (also services: renting of machinery and equipment, computers and related activities, R&D, financial services etc.)
- domestic demand for labor (overall and for **different skill categories**) affected by home and foreign input prices (elasticities of L with respect to own and foreign wages)
- **endogeneity** of trade intensification taken into account.

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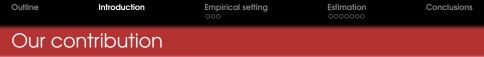- **'Old' and 'New'** EU members at same time
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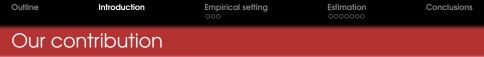- **endogeneity** of trade intensification taken into account.

Data and panel composition

- **'Old': EU-15** and '**New': NMS-5** (Poland, Czech Republic, Slovenia, Hungary, Slovakia)
- **1995-2005**; **13 tradable sectors**
- **Trade data** from UN Comtrade (WITS)
- Sector specific **labor market statistics** from EUKLEMS (overall + by skilled&unskilled workers)
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- **Trade with EU-15 much more important for NMS than trade with NMS for the EU-15.**
  In 2005: max 14% of EU-15 imports (in a sector) were coming from the NMS, while as much as 70% of NMS imports were coming from the EU-15

- 1995-2005: NMS (mainly **NMS-5**) gained importance as a **source of EU-15 imports**

- since 1995 NMS turn from net importers to net exporters **also in more advanced sectors** ('Electrical and optical equipment', 'Transport equipment')

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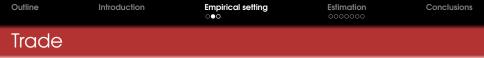- 1995-2005: NMS (mainly **NMS-5**) gained importance as a **source of EU-15 imports**
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- some **asymmetries in sectoral employment growth between 'Old' and 'New' members** (tradable economy grew in EU-15, modest changes in NMS but dynamics of labor differentiated across sectors)

- **skill upgrading both in EU-15 and NMS** but interestingly NMS-5 use less intensively high skill labor in typical high-tech sectors while workers with high education level are employed also in less advanced sectors

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Measurement of labor market interdependencies between EU-15 ('Old) and NMS-5 ('New')

WP_L - average wage (labor cost) in partner countries weighted by import size

$\vee$ country i, sector j, (time t - here omitted)
New' partners: $q = (1, ..., p)$, 'Old' partners: $q = (p + 1, ..., R)$

overall

- $WP_{Lij}^{New} = \frac{\sum_{q=1}^{p} imports_{iqj} * wage_{qj}}{\sum_{q=1}^{p} imports_{iqj}}$

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How does partners' labor cost influence domestic employment level?

Sector level estimation (country i, sector j, time t)

$emp_{ijt} = \alpha + \beta_0 emp_{ijt-1} + \beta_1\ wp_{Lijt}^{New} + \beta_2\ wp_{Lijt}^{Old} + \beta_3 y_{ijt} + \beta_4 w_{ijt} + \delta D_t + \theta D_j + + \mu_{ij} + \epsilon_{ijt}$

emp= {log of persons engaged, employees}
y = log of real output
w = log of real domestic wage
time and industry effects

wp_i^{New} , wp_L^{New} - **logs of partners' wage:'New', 'Old'**
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Employment effects of wage conditions in Partner countries

	SYS-GMM		SYS-GMM		SYS-GMM	
	1st step	2nd step	1st step	2nd step	1st step	2nd step
Panel B	(Dep.variable DOMESTIC EMPLOYMENT - Number of Employees)					
	All Sample		'New' (NMS-5)		'Old' (EU-15)	
emp_{-1}	0.881***	0.874***	0.842***	0.822***	0.961***	0.957***
	(0.045)	(0.052)	(0.048)	(0.074)	(0.017)	(0.019)
w	-0.738*	-0.824*	-1.533	-2.935	-0.382**	-0.377*
	(0.447)	(0.424)	(0.998)	(1.862)	(0.178)	(0.196)
y	0.056**	0.063**	0.04	0.029	0.021	0.023
	(0.027)	(0.031)	(0.035)	(0.064)	(0.025)	(0.023)
wp_L^{Old}	-0.115*	-0.114*	-0.114	-0.062	-0.075**	-0.077*
	(0.064)	(0.065)	(0.114)	(0.175)	(0.035)	(0.040)
wp_L^{New}	0.035	0.048	-0.013	-0.016	0.047**	0.050**
	(0.032)	(0.035)	(0.070)	(0.117)	(0.021)	(0.021)
Obs.	2470	2470	650	650	1820	1820
Groups	247	247	65	65	182	182
Hansen	0.06	0.06	0.99	0.95	0.08	0.08
AR(2)	0.56	0.55	0.69	0.7	0.54	0.53

Note: Robust Standard Errors in Brackets.
All estimates bear industry dummies and common time effects.

Elasticities (ϵ) of domestic labor demand with respect to own and foreign wages (1)

ϵ based on the estimation of **cost shares of high and low skilled labor**: (Berndt, 1991; Hijzen et al., 2005)

$\forall k$ = **h (high skill),l (low skill)**; $\forall z = \{Old, New\}$; country i, sector j, time t

- $\tilde{S}_{ht} = \alpha_h \tilde{S}_{ht-1} + \sum_{k=h}^{l} \beta_{hk} * \frac{\tilde{w}_{kt}}{\tilde{p}_{mt}} + \gamma_{hy} * \tilde{y}_t + \sum_{z=New}^{Old} \sum_{k=h}^{l} \delta_{hk}^z * \tilde{wp}_{kt}^z$

- $\tilde{S}_{lt} = \alpha_l \tilde{S}_{lt-1} + \sum_{k=h}^{l} \beta_{lk} * \frac{\tilde{w}_{kt}}{\tilde{p}_{mt}} + \gamma_{ly} * \tilde{y}_t + \sum_{z=New}^{Old} \sum_{k=h}^{l} \delta_{lk}^z * \tilde{wp}_{kt}^z$

w_k - log of domestic hourly wage
wp_k^z - log of weighted cost of labor in partner countries
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Elasticities (ϵ) of domestic labor demand with respect to own and foreign wages(2)

$\forall n$ = **h (high skill),l (low skill)**

- $\epsilon_{nn} = \frac{\beta_{nn} + S_n^2 - S_n}{S_n}$; $n = \{h, l\}$
- $\epsilon_{nm} = \frac{\beta_{nm} + S_n S_m}{S_n}$; $n, m = \{h, l\}$ and $n \neq m$

for example $\epsilon_{L_l w p_l}$:

- if **positive** elasticity of L_l with respect to $w p_l$ then domestic and foreign low skill labor are **substitutes** (thus **competition** between domestic low skilled and foreign low skilled)
- if **negative** elasticity - then **complementarity**

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Elasticities - by alternative skill definitions, sector and country typologies

- alternative definitions of low and high skilled (where medium skill workers should be put?)
  - $h_1 = HS$; $l_1 = MS + LS$
  - $h_2 = HS + MS$; $l_2 = LS$
- estimates by sectors groups - heterogeneity of sectors (low skill intensive and high skill intensive)
- estimates by EU-15 subgroups - heterogeneity within 'Old' group
  - specialising in skill intensive sectors or not
  - more involved and less involved in trade with NMS

Elasticities L vs wp - selected results 1

Panel A:			$h_1 = HS$ $\quad l_1 = MS + LS$ DOMESTIC LABOUR			
	All Sample		'New' (NMS-5)		'Old' (EU-15)	
	L_{h_1}	L_{l_1}	L_{h_1}	L_{l_1}	L_{h_1}	L_{l_1}
w_{h_1}	-0.76***	0.05***	-0.98***	0.05***	-0.67***	0.05***
	(0.03)	0)	(0.05)	0)	(0.03)	0)
w_{l_1}	0.21***	-0.78***	0.17***	-0.82***	0.22***	-0.77***
	0)	0)	0)	0)	0)	0)
y	-0.13***	-0.09***	-0.14***	-0.14***	-0.14***	-0.09***
	(0.02)	(0.01)	(0.04)	(0.02)	(0.02)	(0.01)
$wp_{h_1}^{Old}$	0.03	0.06*	-0.26	0.2*	0.03	0.02
	(0.07)	(0.04)	(0.19)	(0.12)	(0.07)	(0.03)
$wp_{l_1}^{Old}$	-0.02	0	0.18	-0.24	0	0.07*
	(0.08)	(0.04)	(0.23)	(0.14)	(0.08)	(0.04)
$wp_{h_1}^{New}$	0.11***	-0.03	0.87***	0.19**	0.01	-0.06***
	(0.06)	(0.03)	(0.15)	(0.1)	(0.05)	(0.03)
$wp_{l_1}^{New}$	-0.17***	-0.03	-1.14***	-0.31***	-0.05	0.02
	(0.05)	(0.03)	(0.16)	(0.1)	(0.05)	(0.03)

Elasticities L vs wp- selected results 2

Panel A:		$h_1 = HS$ $l_1 = MS + LS$ EU-15 ('OLD') DOMESTIC LABOUR					
		High Skill intensive sectors		High Skill intensive sectors excl. Services		Low Skill intensive sectors	
		L_{h_1}	L_{l_1}	L_{h_1}	L_{l_1}	L_{h_1}	L_{l_1}
'OLD' LESS INVOLVED	$wp_{h_1}^{old}$	-0.04	0.05	-0.16	0.07	0.59***	-0.03
		(0.09)	(0.06)	(0.24)	(0.13)	(0.14)	(0.07)
	$wp_{l_1}^{old}$	-0.21**	-0.12*	0.18	-0.08	-0.27	0.09
		(0.1)	(0.07)	(0.26)	(0.14)	(0.17)	(0.08)
	$wp_{h_1}^{new}$	0.36***	0.03	0.28**	0	-0.08	0
		(0.09)	(0.06)	(0.14)	(0.08)	(0.09)	(0.04)
	$wp_{l_1}^{new}$	-0.44***	-0.15**	-0.26*	-0.09	-0.01	-0.03
		(0.1)	(0.06)	(0.14)	(0.08)	(0.08)	(0.04)
'OLD' MORE INVOLVED	$wp_{h_1}^{old}$	0.04	-0.07	0.03	-0.23*	0.66***	-0.27***
		(0.18)	(0.09)	(0.27)	(0.12)	(0.15)	(0.06)
	$wp_{l_1}^{old}$	-0.01	0.11	0.01	0.33***	-0.61***	0.35***
		(0.2)	(0.09)	(0.29)	(0.13)	(0.16)	(0.07)
	$wp_{h_1}^{new}$	-0.08	0.08	-0.12	-0.13	-0.46***	-0.14***
		(0.13)	(0.07)	(0.25)	(0.11)	(0.1)	(0.04)
	$wp_{l_1}^{new}$	-0.01	-0.13*	0.09	0.14	0.43***	0.13***
		(0.14)	(0.07)	(0.26)	(0.11)	(0.09)	(0.04)

Conclusions

- Revealed interaction mechanisms between EU-15 and NMS-5 labor markets, resulting from the intensification of trade relations between 'Old' and 'New' member states;

- In particular domestic EU15 employment levels negatively related to wage conditions in EU-15 partners (complementarity) and positively related to wage levels in 'New' partners (substitution)

- Competition between EU15 and NMS-5 labour especially considers workers employed in low skill intensive sectors in those 'Old' countries that trade intensively with the 'New' ones

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Thank You!

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