

**Foreign Ownership Wage Premia in Emerging Economies:  
Evidence from Czech Republic**

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## Motivation (1)

- CEE countries: transition process, large-scale privatization and opening towards global economy => increased FDI.
- Czech Republic, highest FDI inflows in CEE – a perfect candidate for analysis.
- FDI also encouraged from the local governments, e.g. tax holidays, preferential loans, preparation of greenfields
- Lively discussion about whether promoting foreign investments is beneficial or not (e.g. Kohout, *Lidove Noviny*, 2005)

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## Motivation (2)

- Observed higher productivity and higher average wages in foreign owned firms
- => a relatively large literature on comparison of wage or productivity levels between domestic and foreign owned firms and attempts to explain the observed differences.
- findings differ considerably between developed and less developed countries.
- What about new market economies in Central and Eastern Europe?

## Aim

- We look the relationship between *wages, labour productivity and ownership* using LEED covering a large fraction of the Czech labour market in 2006.
- consider different explanations for foreign ownership wage premia
- distinguish *between different origins of ownership* and study both wage and productivity differences.
- inform the ongoing discussion on *prons* and *cons* of attracting foreign investors.

## Hypotheses

- Location of foreign-owned firms to CEE – lower costs of production “sweatshops” or closeness to new expanding markets
- Konings and Murphy (2006): mainly the latter
- **Why would foreign firms pay higher wages?**

## What causes the foreign-domestic wage differential?

1. foreign owned firms typically locate into certain industries and regions - evidence of MN firms entering industries with higher profits
2. human capital -foreign owned firms employ workers with higher qualifications =>higher wages. Why? the success of firms in international markets is due to having higher quality capital, tangible as well intangible => they need more skilled labour to work with it. BUT this would imply that it is not only employees working in foreign owned firms who receive a premium but also those employed in domestically owned MN firms receive a premium.
3. rent-sharing - within foreign owned firms profits are shared with workers across borders; see eg Budd, Konings and Slaughter. (2006).
4. higher wage to reduce worker turnover and knowledge spillover - in post-transition economies where skills learned in successful MN companies is a particularly scarce resource, foreign firms may, in order to retain their employees and not loose the investments made in them, pay their workers a wage premium.

## Previous evidence

- Two categories:
  - studies comparing domestic and foreign owned firms
    - examine the importance of differences in observable characteristics of the firms as well as their employees.
    - see e.g., Conyon et al. (2002) and Girma et al. (2001) for the UK, Lipsey and Sjöholm (2004) for Indonesia and Martins (2004) for Brazil.
  - studies focussing on the wage consequences of *changes* in ownership
    - exploit panel data and use fixed effects or difference-in-difference methods to control for unobservables.
    - See e.g. Huttunen (2007) for Finland, Heyman et al. (2006) for Sweden and Martins and Esteves (2008) for Portugal and Brazil.
  - Most focus on firm averages, individual level analyses scarce

## Data

- **Trexima CR linked employer-employee data set, year 2006**  
*detailed information on employees (but no panel):*
  - Hourly Wage (but also monthly, bonuses, overtime.. High quality info)
  - Gender
  - Age
  - Tenure
  - Education
  - Occupation*detailed information on over 3000 firms (panel):*
  - Region NUTS3 (kraje)
  - NACE 3 digits
  - Size of firm
  - Ownership and owners country of origin
- **Creditinfo CR financial information from firms balance sheets and income statements – merged with the LEED:**
  - Sales, profits, fixed assets, materials and value added

## Data – our sample, year 2006

<i>Foreign Ownership</i>	<i>No. of firms</i>	<i>Av. size</i>	<i>Total employment</i>	<i>Av. hourly wage</i>
<b>EU15/EEA/CH</b>	527	696	366 728	151
<b>Other Europe</b>	31	418	12 944	153
<b>Asia</b>	12	930	11 149	114
<b>America</b>	18	694	12 486	183
<b>Czech</b>	2184	376	820 842	118

*Most employed in DE, NL, AT, FR, CH, LU, GB, US – owned firms*

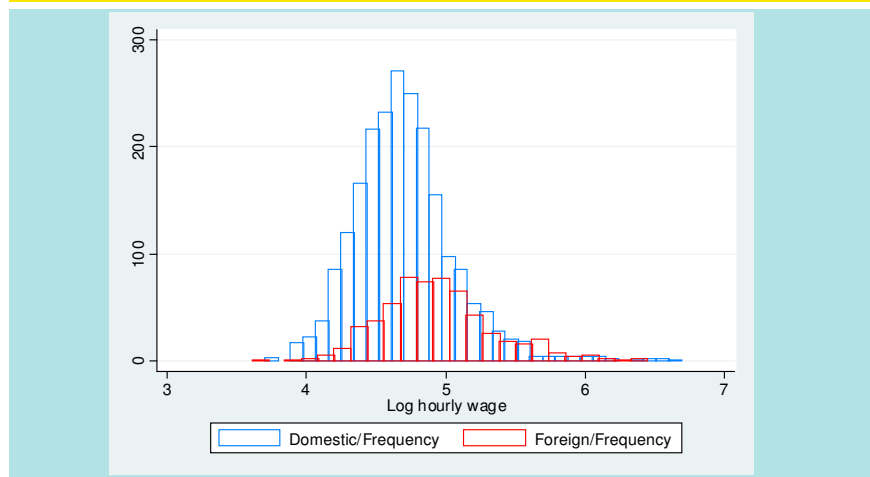
## Some descriptive statistics

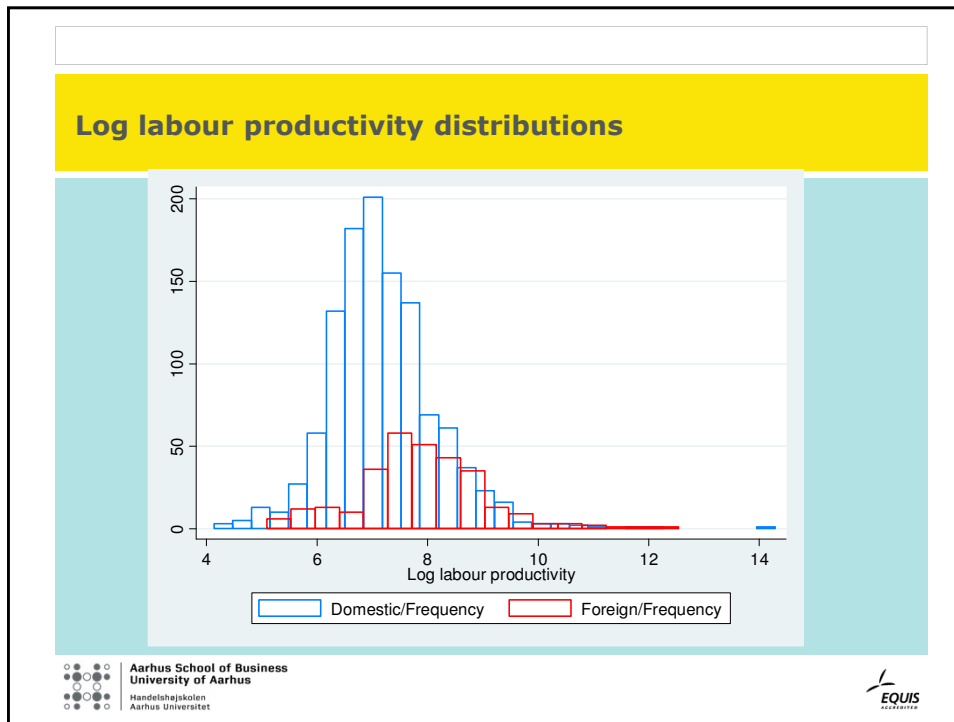
<u><i>Human capital :</i></u>	<i>Foreign</i>	<i>Domestic</i>	<i>Western Europe</i>	<i>Other Europe</i>	<i>Asia</i>	<i>U.S.</i>
Average age (years)	<b>37.5</b>	<b>42.2</b>	37.6	39.2	34.1	37.0
Average tenure (years)	<b>5.8</b>	<b>8.2</b>	5.8	7.3	4.1	6.4
Vocational training (%)	13.5	13.7	14.1	7.6	13.3	6.1
University level education (%)	11.1	10.0	10.6	16.6	6.5	18.8
Females (%)	<b>43.1</b>	<b>37.2</b>	43.4	37.9	42.0	40.9
White collar (%)	43.3	44.3	42.3	56.9	27.0	57.2
Foreign workers (%)	<b>4.4</b>	<b>2.4</b>	3.7	14.7	13.7	4.1

## Some descriptive statistics

<i>Other (%)</i> :	<i>Foreign</i>	<i>Domestic</i>	<i>Western Europe</i>	<i>Other Europe</i>	<i>Asia</i>	<i>U.S.</i>
Prague Region	25.2	12.7	24.7	25.8	8.3	50.0
Manufacturing , mining	<b>63.4</b>	<b>37.7</b>	63.8	45.2	100	61.1
Retail	11.9	11.9	11.8	19.4	0	11.1
Hotels, transport	5.6	7.0	5.5	3.2	0	16.6
Banking	<b>6.0</b>	<b>1.7</b>	6.1	3.2	0	11.1
Business services	7.3	9.9	6.6	25.8	0	0
Education, health and culture	2.0	7.9	2.9	0	0	0

## Log hourly wage distributions





### Econometric analysis

- We begin with analyses of firm level data, i.e. the dependent variable is the average firm wage.
- We account for differences in the compositions in firms' workforces and firms characteristics such as regions, industries and firm size.
- Focus on coefficients on ownership variable.

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## RESULTS: firm regressions

Firm level variables	DepVar: <i>Firm Log Hourly Wage</i>			
<b>Foreign</b>	<b>0.236**</b>	<b>0.215***</b>	<b>0.177***</b>	<b>0.162***</b>
Average age	-	-0.011***	-0.011***	-0.010***
St dev age	-	-0.014***	-0.005	-0.006
Average tenure	-	0.01***	0.012***	0.013***
St dev tenure	-	0.00002	-0.003	-0.006*
Share females	-	-0.384***	-0.413***	-0.419***
Share foreigners	-	-0.296***	-0.284***	-0.300***
Share no or primary	-	-0.208	-0.036	-0.055
Share vocational	-	-0.185***	-0.104***	-0.114***
Share university	-	1.503***	1.486***	1.501***
Firm size	-	-	-	0.018***
Regions	-	-	Yes	Yes
Industry	-	-	Yes	Yes
Observations	2754	2754	2754	2754
R-squared	0.065	0.533	0.604	0.607

## RESULTS: firm regressions - summary

- The raw difference in average wages between foreign and domestically owned firms is 23.6 per cent.
- Account for differences in the composition in firms' workforces -> reduced 2 % only. ( $R^2$  jumps from 0.06 to 0.53)
- Add regions and industries reduces the differential to 18 % and controlling for firm size leads to a further drop to 16 %.
- **Thus, about 2/3 of raw foreign-domestic differential remains after all the explanatory variables have been entered.**



## ANALYSIS - origins of ownership

Four groups of origin:

- the 15 old EU member states+EEA+Switzerland = Western Europe
- other European countries
- Asia
- United States

Fitte og behageligt arbejde og gode premier i den danske arbejdsmarked.

## RESULTS: firm regressions – origins of ownership

Firm level variables	DepVar: Firm Log Hourly Wage			
<b>EU15+EEA +CH</b>	<b>0.236***</b>	<b>0.224***</b>	<b>0.184***</b>	<b>0.169***</b>
<b>Other Europe</b>	<b>0.218***</b>	<b>0.107**</b>	<b>0.107**</b>	<b>0.103**</b>
<b>Asia</b>	<b>-0.003</b>	<b>0.044</b>	<b>0.057</b>	<b>0.035</b>
<b>US</b>	<b>0.412***</b>	<b>0.225***</b>	<b>0.173***</b>	<b>0.157***</b>
Human capital	-	Yes	Yes	Yes
Firm size	-	-	-	Yes
Regions	-	-	Yes	Yes
Industry	-	-	Yes	Yes
# observations	2,754	2,754	2,754	2,754
R-squared	0.067	0.534	0.604	0.607

## RESULTS: firm regressions – origins of ownership, summary

The unconditional differences relative to domestic firms differ widely:

- it is 24 per cent for the EU15+EEA+CH countries,
- 22 per cent for other European countries,
- 41 per cent for the U.S. owned companies and
- no significant pay differences for Asian owned firms.

Controlling for HC, firm size, region and industry:

- the differentials shrink for the EU15+EEA+CH group by a third,
- for American firms more than half,
- is halved for the other European countries group,

**=> Some heterogeneity across owner-country groups.**

## Econometric analysis – individual level

- Standard Mincerian equation on individual employees + ownership vars.
- Control for experience- tenure, age - education and gender:

$$\log W_{it} = \beta_0 + \beta_1 AGE + \beta_2 (AGE)_{it}^2 + \beta_3 TENURE_{it} + \beta_4 (TENURE)_{it}^2 + \beta_5 GENDER_{it} + \sum \beta_j (EDU_j)_{it} + \varepsilon_{it}$$

- add industry, region and ownership controls and control for time invariant firm-specific characteristics.

## RESULTS: individual regressions, year 2006

	DepVar: Log Hourly Wage			
<b>Foreign</b>	<b>0.068***</b>	<b>0.144***</b>	<b>0.151***</b>	<b>0.144***</b>
Age		0.018***	0.02***	0.02***
Age-squared		-0.023***	-0.025***	-0.025***
Tenure		0.028***	0.024***	0.024***
Tenure-squared		-0.053***	-0.045***	-0.044***
Female		-0.217***	-0.205***	-0.207***
Foreigner		-0.015***	-0.024***	-0.025***
No or primary		-0.252***	-0.202***	-0.199***
Vocational		-0.2***	-0.175***	-0.175***
University		0.672***	0.632***	0.633***
Firm Size		No	No	0.011***
Regions		No	Yes	Yes
Industry		No	Yes	Yes
# observations	1,015,027	1,015,027	1,015,027	1,015,027
R-squared	0.004	0.38	0.445	0.446

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## RESULTS: individual regressions - origins of ownership

	DepVar: Log Hourly Wage			
<b>EU15+EEA+CH</b>	<b>0.069***</b>	<b>0.148***</b>	<b>0.154***</b>	<b>0.147***</b>
<b>Other Europe</b>	<b>0.119***</b>	<b>0.037***</b>	<b>0.085***</b>	<b>0.084***</b>
<b>Asia</b>	<b>-0.099***</b>	<b>0.075***</b>	<b>0.119***</b>	<b>0.118***</b>
<b>US</b>	<b>0.062***</b>	<b>0.183***</b>	<b>0.165***</b>	<b>0.159***</b>
Human capital,	No	Yes	Yes	Yes
Firm size	No	No	No	Yes
Regions	No	No	Yes	Yes
Industry	No	No	Yes	Yes
# observations	1,015,027	1,015,027	1,015,027	1,015,027
R-squared	0.004	0.38	0.45	0.45

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## RESULTS: individual regressions – summary

- **The unconditional individual level foreign ownership premium is considerably lower - 6 % - than for firm average wages;**
- Add HC, size, region and industry dummies, **the differential even increases;** In the full model, the foreign ownership premium is **15 %**.
- The unconditional premium is highest in the US and EU15EEA+CH owned firms. Asian owned firms -> lower wages than domestic firms.
- Controlling for HC and firm characteristics, there is an increase in the premium for employees in EU15EEA and US-owned firms. Now positive premium for employees from Asian-owned firms. A small decrease in the wage premium in the non-EU/EEA European firms.
- **clear differences in HC, industry affiliation and firm size between firms with owners from different groups of countries.** Accounting for these differences significantly affects the wage premium estimate.

## ANALYSIS – white- and blue-collar workers

- Testing the labour turnover prevention hypothesis:
  - => if foreign firms pay their employees a premium to reduce labour turnover, this is likely to show up mainly for white-collar workers through whom most of the potential knowledge transfer would occur.
- => does the wage premium differ between white- and blue-collar workers?**

### RESULTS: division by white- and blue-collar workers

	White	Blue	White	Blue	White	Blue	White	Blue
Foreign	0.111***	0.070***	0.169***	0.131***				
EU15/EEA					0.108***	0.074***	0.170***	0.138***
Other Europe					0.253***	0.009	0.162***	-0.028***
Asia					0.086***	-0.095***	0.162***	0.083***
US					0.047***	0.105***	0.166***	0.173***
HC, firm size	No	No	Yes	Yes	No	No	Yes	Yes
Regions	No	No	Yes	Yes	No	No	Yes	Yes
Industry	No	No	Yes	Yes	No	No	Yes	Yes
R <sup>2</sup>	0.008	0.010	0.45	0.43	0.009	0.012	0.45	0.43

### RESULTS: individual regressions by white- and blue-collar workers, summary

- the differential between white- and blue-collar workers is small: about 4 %
- For WE- and US- owned enterprises, the difference between blue- and white-collar workers' premia is rather small.
- Asian firms - the premium is about twice as large for white-collar employees than for blue-collar workers.
- Owners from "other Europe" – relatively large difference between blue- and white-collar workers' premia .
- The same pattern for skilled/unskilled workers

## Age of firm, level of technology

- Wage premium to compensate for job uncertainty (more elastic labour demand)
- Which foreign firms provide more uncertain jobs?
- **Younger** firms (many Greenfield births; older are mainly acquisitions)
- Young firm: less than 12 years. Defined on the basis of tenure information
- Firms using more advanced technology have stronger incentives to retain workers and pay a premium
- More advanced: complex measure of R&D expenditures, software use, licenses, patents (value above mean)

## Findings

- Run wage regression with OLD FIRM and HighTECH dummies and their interactions with FOREIGN
- Find: similar patterns for firm level and individual level regressions
- Main effects: foreign owned firms pay a premium. High tech firms do too (including it reduces the foreign firm effect somewhat).
- Old firms have lower wages in individual level regression (insignificant in firm level analysis)
- Interactions: all insignificant in firm level regression. Tiny (but significant) positive effects of old and high tech in individual level regressions
- Little support for the uncertainty hypothesis; weak support for the retention hypothesis

## ANALYSIS – wage and productivity differences

- A simple regression of firm-level production function with foreign ownership dummies: large productivity differences between foreign and domestic firms:
  - from 47 to 39 % when log sales and log value added are used as dependent variables, respectively.
- *Q: to what extent do differences in wages between foreign and domestic reflect differences in productivity?*
- Following Brown and Medoff (1978), Hellerstein and Neumark (1999) and Hellerstein et al. (1999) we **jointly estimate firm level production functions and hourly wage functions.**
- Use Wald test to test for equality of the foreign-domestic productivity and wage differential estimates.

## RESULTS: SUR estimates of wage and production functions

	Log sales	Log hourly wage	Wald test (chi2 (1)) <sup>b</sup>
<b>Foreign owned</b>	<b>0.258***</b>	<b>0.156***</b>	<b>4.05***</b>
Age	-0.044***	-0.015***	23.80***
Tenure	0.009	0.007***	10.24***
Share females	-0.639***	-0.405***	6.29***
Share no education	0.813	-0.004	0.53
Share lower secondary	-0.307***	-0.132***	1.86
Share university degree	2.829***	1.835***	16.10***
Share foreign workers	-0.236**	-0.310***	0.05
Other regressors	K,L,M		
Controls: region, industry	Yes	Yes	
"R <sup>2</sup> "	0.825	0.622	
N of observations	1,091	1,091	

### RESULTS: SUR estimates of wage and production functions

	Log sales	Log hourly wage	Wald test (chi2 (1)) <sup>b</sup>
EU15/EEA/CH	0.290***	0.169***	5.26**
Other Europe	-0.089	0.033	0.50
Asia	0.015	0.011	0.00
US	0.315	0.173*	0.38
Human capital	Yes	Yes	
Other regressors	K,L,M		
Controls: region, industry, size	Yes	Yes	
"R <sup>2</sup> "	0.825	0.625	
N of observations	1,091	1,091	

### RESULTS: wage and productivity differences, summary

- Foreign owned firms have a total factor 26% (27% - log value added) higher than in the domestic firms.
  - A notable fraction of the raw productivity differential – 47% (39 %) is explained by differences in human capital, region and industry.
  - WE AND US firms considerable more productive than domestic firms and the other foreign firms.
  - The WE and US wage differential with respect to the domestic firms is about *half* of the productivity difference
- ⇒ if the foreign owned pay their employees their marginal productivity, the wage gap between foreign and domestic firms would be almost twice as large as now.



## CONCLUSIONS (I)

### HUMAN CAPITAL AND LOCATION DO NOT EXPLAIN MUCH

1. location in industry or region plays only a marginal role in explaining the wage differential between foreign and domestic firms. => **most of the wage difference is within industry and region.**
2. **differences in human capital explain only a small part of the wage differential.**
  - foreign multinational firms in Czech Republic do not seem to employ more highly qualified labour than domestic firms.
  - controlling for human capital variables leads to only a small reduction in the foreign ownership premia in the firm-level analysis, and actually gives rise to an increase in the differential in the individual-level regressions.

## CONCLUSIONS (II)

3. Hypotheses of payment of higher pay as a means to reduce worker turnover and to **prevent knowledge spillover.**
  - the premium is higher for white collar (skilled) workers but the difference relative to the blue collar (unskilled) workers is quite small. No (little) support of the prevention of spillover hypothesis.
4. **The hypotheses of rent-sharing**
  - joint estimation of productivity and wage equations show that the gap in total factor productivity between foreign and domestically owned firms is almost twice as large as the corresponding gap in wages.
5. **Employment uncertainty**  
 little support

## CONCLUSIONS (III)

- **Differences between 4 groups of owner countries:**

- firms from *other European countries* deviate from the average picture:
- Accounting for human capital has a bigger impact on the premium for firms from these countries which are like Czech Republic mainly transition economies from CEE.
  - They also differ in that they only pay their white collar workers a premium, whereas the pay for blue collar workers in these firms is below that in the domestically owned firms.
  - However, only 5 % of all foreign owned firms from the countries in our data set + they are smaller => only 3 % of employment.
- Asian owned firms differ too – a similar pattern to other European countries