Labor Market Effects of International Trade, FDI and Production Sharing

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Study Materials and Reading List

- Slides of the lectures

- All materials provided on: http://home.cerge-ei.cz/pytlikova/LaborSpring16/

Compulsory Readings:
- Ehrenberg and Smith: Modern Labor Economics, Chapter 16, the Labor Market Effects of International Trade and Production Sharing
- Cahuc, Carcillo and Zylberberg: Labor Economics, Chapter 11, Globalization, employment and inequality

Other Relevant Literature:
- Dutt P., Mitra, D. and P. Ranjan (2009): "International trade and unemployment: Theory and cross-national evidence" Journal of International Economics, 2009, vol. 78, is.1, pp 32-44.
Felbermayr,G. Prat, J.and HJ Schmerer (2011): "Trade and unemployment: What do the data say" European Economic Review 55 (6), pp. 741-758.
Hummels, D., Munch J.R. and Ch. Xiang (2016): Offshoring and Labor Markets. IZA DP No 9741.
Eriksson, T., Pytlikova, M and F. Warzynski (2013): "Increased Sorting and Wage Inequality in the Czech Republic: New Evidence Using Linked Employer-Employee Dataset." *Economics of Transition*, Vol. 21, Issue 2, pp. 357-380.

OUTLINE

- **What are the labor market effects of GLOBALIZATION?**
- **Why Does Trade Take Place?**
  - Trade between Individuals and the Principle of Comparative Advantage
  - The Incentives for Trade across Different Countries

- **Effects of Trade on the Demand for Labor**
  - Product Demand Shifts
  - Shifts in the Supply of Alternative Factors of Production
  - The Net Effect on Labor Demand

- **Effects of trade on wage inequality**

- **Labor Market Effects of Production Sharing, Offshoring, Outsourcing and FDI**

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➢ Globalization has made it increasingly unclear what "domestic" output is, and this is due to the geographic dispersion of the various steps in the production process – "*production "sharing*"/ *"offshoring"*

➢ We now experience increased movements of components, services, and final goods across international borders, increased trade of both imports and exports.

➢ Domestic workers now face increased competition from a huge number of lower-paid foreigners.

- Production sharing means work is being outsourced or "offshored" to other (low-wage) countries.

➢ Domestic workers – or at least a large segment of them (mostly low skilled) – are being made worse off by a more integrated world economy *(or are they?)*

Why Does Trade Take Place?

➢ Recall that the function of a market is to facilitate mutually beneficial transactions, which will be socially beneficial (Pareto improving) if some gain and no one loses.

➢ Transactions across international borders take place between countries and these transactions   are also beneficial to all countries involved.

➢ Overall, most economists would agree that trade is mutually beneficial, more so, in the diffusion of technology.

Why Does Trade Take Place?

Trade between Individuals and the Principle of Comparative Advantage

➢ Make-or-buy decisions are made by weighing the opportunity costs of doing tasks ourselves against the costs of buying the goods or services from others.
  • Fostering specialization and *trade*

➢ Performing all activities (household or other) by ourselves without specialization will lead to inferior outcomes and prevent us from utilizing our time in others ways, which may be either more productive or more pleasant.

Why Does Trade Take Place?

➤ The first step in the make-or-buy decision is for each party to perform an *internal* comparison: individuals must consider their *own* opportunity costs of producing the good or service in question.

➤ Economists agree that *comparative advantage* is the basis of trade between two or more individuals/countries.

➤ The principle of comparative advantage underlies all decisions about trade with others.

   • Individuals have the incentive to *specialize* in the production of goods or services in which they have comparative advantage and buy from others the goods or services they would find more expensive to produce themselves.

Benefits from free trade – trade theories

   • **Ricardo**: gains from specialisation on comparative advantage
      • comparative vs. absolute advantage
      • E.g. if a country has an abundance of labor, that country will have a comparative advantage in the production of labor-intensive goods.
   • **Heckscher-Ohlin**
      • gains from specialisation on goods, which intensively use abundant factors in production
      • E.g. Countries export commodities produced through the intensive use of factors which they possess in abundance. Labor abundant countries export labor-intensive commodities and import capital-intensive commodities
   • **Stolper and Samuelson theorem, 1947,** trade liberalization -> a rise in the relative price of a good will lead to a rise in the return to that factor which is used most intensively in the production of the good, and conversely, to a fall in the return to the other factor (see Cahuc et al, Labor Economics)
      • E.g. the wages of the unskilled workers should decline in developed countries and rise in poor countries as a consequence of trade,
      • The theorem predicts that, when developed economies engage in trade with emerging/developing countries, the unskilled workers of developed economies are expected to lose, while owners of capitals are expected to gain.

Benefits from free trade – trade theories

- **Firms, Selection and Trade**
- **New Trade Theory** (e.g. Krugman, 1985): gains from exploiting economies of scale, increasing product differentiation and higher competition

Paul Krugman – 2008 Nobel Prize winner in economics

- explanation of trade between similar countries (JIE 1979)

- Krugman assumes that **consumers prefer a diverse choice** of brands, and that production favors **economies of scale**.

-Consumers' preference for diversity explains the survival of different versions of cars like VW and BMW. But because of economies of scale, it is not profitable to spread the production of VW and BMW all over the world; instead, it is concentrated in a few factories and therefore in a few countries (or maybe just one).

- This logic explains how each country may specialize in producing a few brands of any given type of product, instead of specializing in different types of products.

-In Krugman's "love for variety" model, all firms are identical. However, in reality, exporting firms are bigger, more productive and pay higher wages than non-exporting firms.

-Melitz (2003) incorporates this heterogeneity and highlights the selection effect, for a model see Cahuc et al. Labor Economics.

The Mechanics of Trade Gains

- Trade as indirect production: outward-shift of the production possibility frontier

- Trade increases consumer's utility: outward-shift of the indifference curve

- In models with increasing returns to scale, trade:
  - reduces average production costs
  - reduces prices
  - increases the number of goods available on each market

Distribution of Trade Gains

Benefits from free trade:

- All together, trade increases output, income and utility of consumers (most empirics rather conclusive in this respect – important to take care of causality problems of e.g. "trade openness" and output..)
- E.g. a nice natural experiment of Japan in mid 19 century, moving from complete "autarky" to virtually free trade from 1870 - the price changes of imported and exported goods were large, gains from trade positive, but surprisingly small(Bernhofen and Brown, AER2005)
- Some studies on trade gains from EU-15 with CEEC trade – quite small:

    - Frankel and Romer (1999) used a sample of 150 countries to analyse the influence of trane od per capita income in 1985. They instrumented trade by geographical determinant. 1 % increase in trade share raises income per capita by 2 %

    – Baldwin et al. (1997): 0.2% of the EU's
    – Keuschnigg/Kohler (1997): 0.8% for Austria
    – Kohler (2000): 0.4-0.5% for Germany
    – But: 3%-5% for the CEEC-10

Distribution of Trade Gains

But:

- *reallocating resources* - Sectoral shifts or changes in both countries are costly and often painful for those workers and owners who are displaced

Trade affects labor markets:

- Labor demand - employment, wages
- the distribution of income (following also the Stolper and Samuelson theorem's stipulations),
- =>not all production factors necessarily gain…

The rise in the volume of trade (2) - The evolution of trade between industrialized and developing countries
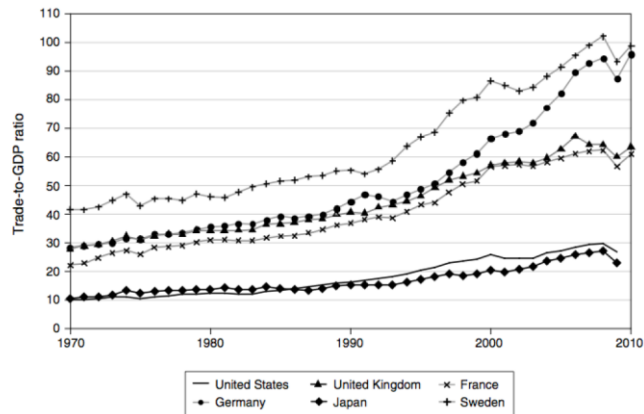

FIGURE 11.1
Trade openness, 1970–2010.

Note: Trade openness is defined by (exports + imports)/GDP. Values at constant prices, constant exchange rates (base year 2000).

Source: OECD Macro trade indicators.

The rise in the volume of trade (6) - International trade, unemployment, and inequalities

International differences in the cost of labor in manufacturing industry

- ► In developing countries, large pools of unskilled labor exist
- ► Table 1 compares the cost per hour of blue-collar worker in industry in the US with that of certain developing countries in 1997 and 2011. The differences are considerable
- ► Since workers in poor countries consume products locally produced, the differences in purchasing power are less than the differences in cost
- ► Even if the developing countries have a technological lag, the size of the cost difference for low-skilled labor gives them an advantage in the production of goods requiring this type of labor

The rise in the volume of trade (7) - International trade, unemployment, and inequalities

European Union (27)		U.S.A.		Japan		China	
1. China	17.3	China	18.4	China	21.5	EU (27)	12.1
2. Russia	11.8	EU (27)	16.6	EU (27)	9.4	Japan	11.2
3. US	10.9	Canada	14.1	US	8.9	Korea	9.3
4. Norway	5.5	Mexico	11.7	Australia	6.6	Taipei	7.2
5. Switzerland	5.5	Japan	5.9	Saudi Arabia	5.9	US	7.1

Table 1: The origin of imports into the European Union countries, the United States, Japan and China in 2011.
Legend: 18.4 percent of the imports of the United States come from China.
Source: World Trade Organization, http://www.wto.org

The rise in the volume of trade (8) - International trade, unemployment, and inequalities

	In U.S. dollars		U.S.=100	
	1997	2011	1997	2011
Sweden	25.0	49.1	108.6	138.3
Germany	29.2	47.4	126.6	133.4
France	24.9	42.1	107.9	118.5
Italy	19.8	36.2	85.7	101.8
Japan	22.0	35.7	95.4	100.5
United States	23.0	35.5	100.0	100.0
United Kingdom	19.3	30.8	83.7	86.6
Spain	14.0	28.4	60.5	80.1
Korea, Republic of	9.2	18.9	40.0	53.2
Brazil	7.1	11.6	30.7	32.8
Taiwan	7.0	9.3	30.6	26.3
Poland	3.2	8.8	13.7	24.9
Mexico	3.5	6.5	15.1	18.3
Philippines	1.3	2.0	5.6	5.7

Table 2: The cost of labor in manufacturing industry in US dollars, 1997-2011.
Source: Bureau of Labor Statistics, http://www.bls.gov/fls/

The rise in the volume of trade (9) - International trade, unemployment, and inequalities

International trade and unemployment

- ► The regular and massive growth in trade over the last 30 years seemed little affected by economic cycle
- ► In all countries, unemployment varied much more substantially over that period than trade did
- ► More opened countries tend to feature higher unemployment rates

The rise in the volume of trade (10) - International trade, unemployment, and inequalities

- ► The correlation between unemployment and openness is difficult to interpret since trade can be influenced by unemployment (trade policies can become more restrictive) as much as unemployment can be influenced by trade
- ► In a same way, the development of wage inequalities could influence trade policies as much as trade could affect policies wage inequalities

The rise in the volume of trade (11) - International trade unemployment, and inequalities

We observe a negative correlation between unemployment and international trade flows in the long run.

FIGURE 11.3
Unemployment and openness in the 34 OECD countries, over the period 1980–2010.

Note: Averages of unemployment rates and trade-to-GDP ratios (exports and imports/GDP) over the period 1980–2010, except for Chile, the Czech Republic, Estonia, Hungary, Israel, Poland, the Slovak Republic, and Slovenia for which the period starts between 1989 and 1996.

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The rise in the volume of trade (12) - International trade, unemployment, and inequalities

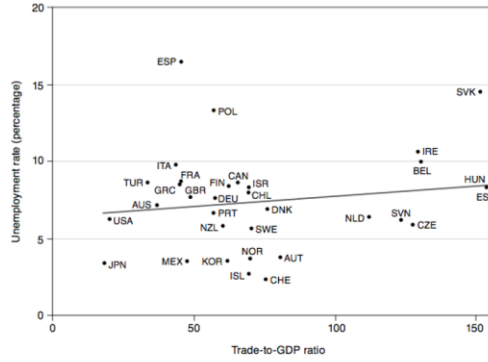We observe a negative correlation between unemployment and international trade flows in the long run.
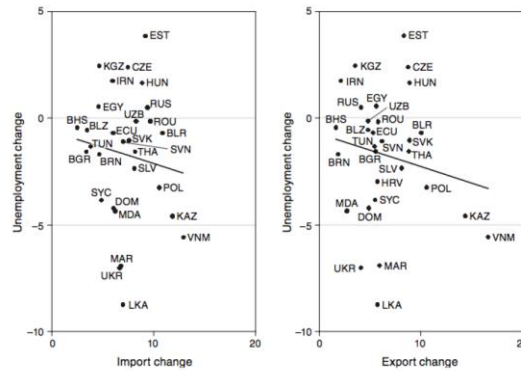

FIGURE 11.5
Change in unemployment and change in exports/imports in the non-OECD countries and in former communist countries, over the period 1990–2012 (percentage points for unemployment, percentage for import and export change).

Effects of Trade on the Demand for Labor

➢ Both trade and technological change open up new opportunities for acquiring goods and services, therefore, expanded trade affects the demand for labor.

➢ Recall that the demand for a given type of labor is derived from:
   (a) conditions in the product market, and
   (b) the prices and productivities of other factors of production.

➢ Trade affects both product demand and the availability of other factors of production.

Effects of Trade on the Demand for Labor

Product Demand Shifts

➢ When exports increase, the demand for workers involved in the production of those exports will shift to the right, due to the expanded scale of production.

➢ An increase in imports associated with increased trade will tend to directly or indirectly *reduce* the demand for some domestically produced goods or services.

➢ The shifts in product demand associated with increased international trade also create shifts in labor demand.
   • Expanded employment opportunities and higher wages for workers if the labor demand curve shifts rightward.
   • Downward pressure on both employment and *nominal* wage levels for workers if the labor demand curve shifts leftward.

Effects of Trade on the Demand for Labor

Shifts in the Supply of Alternative Factors of Production

➢ Production sharing/offshoring, due to international trade, has effectively brought a huge number of lower-paid foreigners into direct competition for jobs with higher-paid domestic workers.

➢ Access to lower-paid workers in other countries has reduced the cost of an alternative source of labor for domestic firms.

➢ What are the effects on domestic labor when lower-wage labor becomes available in other countries?

  • There is a *cross-wage effect* on the demand for labor; that is, the overall effect on the demand for a given kind of labor is the summation of the *substitution and scale effects*, which work in opposite directions

Effects of Trade on the Demand for Labor

The Substitution Effect

• In order to substitute foreign labor for domestic labor, employers consider the *ratio of wages to the marginal productivity* in both countries.

• Only if the ratio of wages to marginal productivity is lower for foreign workers will firms consider substituting foreign workers for domestic.

Effects of Trade on the Demand for Labor

The Scale Effect

- Substituting lower-cost labor in poorer countries for domestic labor in a particular industry will lead to a fall in production costs and thus a fall in product price and an associated increase in product demand.

- The substitution effect of offshoring will push toward reducing the demand for domestic labor, the *scale effect* associated with lower costs will tend to increase it – not clear that overall jobs in the affected sectors will fall.

- The *size* of the scale effect that accompanies the use of lower-wage labor or workers depends principally on two factors:

    (1) the *elasticity of demand for the final product* in the industry that is cutting its labor costs,

    (2) the *share of labor* (*in this case, foreign labor*) in total cost.

- If the foreign workers' wages constitute a larger part of production costs, the resulting effect on production costs and product price will be greater, and the larger will be the associated scale effect.

Effects of Trade on the Demand for Labor

The Net Effect on Labor Demand

➤ Increased trade in goods and services (including production sharing) with foreign countries will benefit some workers but displace others.

➤ Often, less-skilled workers are most likely to *lose* from trade because foreign workers can readily perform in these jobs.

➤ Displaced workers suffer greater losses if it is difficult or costly for them to switch occupations or industries.

➤ Workers most likely to *gain* are those in sectors that have comparative advantage in production or are in jobs that are complementary with production workers overseas.

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Effects of Trade on the Demand for Labor

Estimates of Employment Effects

- It is difficult to isolate the effects of trade on employment levels because there are many other factors (immigration, technology, personal incomes, and consumer preferences) that affect labor supply and demand.
- The labor market structures seem to play a role - In countries with relatively flexible wages & decentralized labor markets, such as the US, the UK, the decline in relative demand for less-skilled labor has translated into lower relative wages for these workers. In contrast, in countries with relatively rigid wages set in centralized labor markets, such as France, Germany, and Italy, it has meant lower relative employment of less skilled.
- about 70 percent of the overall shift in U.S. labor demand in manufacturing was a change in skill demands *within* industries, not *across* industries from less skill-intensive to more skill-intensive.
- income gaps have widened in a number of developing countries as well & labor demand in developing countries has also shifted toward workers with high skill levels relative to the average. For example, research reveals that trade liberalization in Mexico in the mid-to-late 1980s led to increased relative wages of high-skilled workers. We might have expected trade liberalization to boost the demand for unskilled labor & raise unskilled wages, but in fact the opposite has happened in some developing countries.

Effects of Trade on the Demand for Labor

Estimates of Employment Effects

- Several studies on the effect of opening up to international trade on employment/unemployment
- A study by Trefler, (AER 2004) estimated the effect of the Canadian-United States Free Trade Agreement leading to employment fell by 12% in those Canadian industries most affected by the tariffs reduction on imports from the United States, but the *overall employment rate* in Canada was the same in 2002 as it was in 1988.
- Felbemayr et al. (2011) find that trade liberalization lowers unemployment and raises real wage as long as it improves aggregate productivity due to the selection effect.
- Helpman and Itskhoki (2012) show that the relationship between trade and unemployment can be hump shaped – if the labor market of exporting sector is "rigid", unemployment higher than in the non-exporting sector
- Findings from Denmark, the decline in textile industry (Nielsen, NW)

Effects of Trade on the Demand for Labor

Estimates of Employment Effects

- Heterogenous effects – remains an open-ended question
- Usually the "brain" stays at "home", increase in high-tech positions with outsourcing/offshoring manual positions abroad

- Example from *the Washington Post, Guardian and USA Today*

Effects of Trade on the Demand for Labor

Estimates of Employment Effects

- In general, the Stolper-Samuelson model does not fit the evidence very well.
- Empirical studies tell us that at the macro level more trade is associated with less unemployment, not more, at least in the LR.
- The impact of trade on wage inequality is modest at best, and it happens across plants and firms within sectors, and in both developed and developing countries.
- This is consistent with the fact – as we mentioned earlier - that trade is mostly intra-industry and driven by product differentiation (Krugman, 1980, Melitz, 2003), inducing reallocation of factors between firms within a sector.

Empirical specification, cross-sections

- In cross-section databases, information is only observed at one point in time

- A basic regression with cross-section data is:

$$y_i = \alpha + \beta T_i + \mathbf{X}_i \gamma + \varepsilon_i$$

  - y_i is a measure of unemployment or income/wage inequality in country i
  - T_i is a measure of trade such as trade openness
  - $\mathbf{X}_i$ represents a set of controls such as labor market institutions, demography, and the business cycle

Empirical specification, cross-sections

- This equation yields a nonbiased estimate of β if $\mathbb{E}\left(T|\varepsilon\right) = 0$
- This might not be the case for several reasons:
  1. Variables influencing both trade and unemployment may have been omitted. For instance, good macroeconomic policies might lead to more trade openness and less unemployment
  2. There may be **reverse causality**: trade and unemployment may be caused by each of them

- Moreover, the unemployment rate and trade openness are subject to measurement error, which tends to attenuate their relationship

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Empirical specification, example Dutt et al, 2009

- Dutt et al., 2009, obtain a negative and significant effect of openness to international trade on unemployment rates
- In addition to tariffs, the authors use 2 alternative measures to trade: openness and import duties

▶ To account for measurement error, and possible reversed causality, the measure of trade is instrumented by:

$$T_i = \mathbf{Z}_i \delta + \eta_i$$

  ▶ $\mathbf{Z}_i$ a set of instrumental variables influencing trade but not correlated with unemployment, such as country size, distance between trade partners, and other geographical determinants

Empirical specification, example Dutt et al, 2009

	OLS			IV			IV	
$T_i=$ Unweighted tariff	.351***			.750**			.659*	
$T_i=$ Openness		−.024*			−.065**			
$T_i=$ Import duty			.492***			.664***		.453**
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Participation	No	No	No	No	No	No	Yes	Yes
Observations	55	55	54	44	55	43	44	43
R^2	.28	.20	.33	.	.	.	.	.

Table 3: The effect of trade policies on the unemployment rate across countries
Note: controls include the GDP, the output volatility, EPL index, labor union power index, working-age population, civil liberties, black market premium
Source: Dutt et al. (2009) tables 2, 3, 4 and 5/

Empirical specification

▶ Alternative specification: to verify the differential impact of trade on the labor market outcomes, the coefficient of the trade variable has to vary according to the level of capital per capita

▶ Thus, the basic regression becomes:

$$y_i = \alpha + \beta_1 T_i + \beta_2 T_i \cdot (K_i/L_i) + \beta_3 K_i/L_i + \mathbf{X}_i \gamma + \varepsilon_i$$

    ▶ K_i/L_i is the level of capital per head in country i

▶ The results of the OLS regressions of Dutt et al. (2009) using various indicators for trade policies are reported in table 4

Empirical specification, example Dutt et al, 2009

OLS	$T_i =$Unweighted tariff	$T_i =$Openness	$T_i =$Import duty
Trade measure	.227	.158	3.824**
Trade measure × capital-labor ratio	.015	−.017	−.349**
Capital-labor ratio	1.450	1.350	4.521**
Controls	Yes	Yes	Yes
Observations	48	48	47
R^2	.31	.27	.42

Table 4: The effect of trade policies on the unemployment rate depending on the capital to labor ratio.
Note: controls include the GDP, the output volatility, EPL index, labor union power index, working-age population, civil liberties, black market premium .
Source: Dutt et al. (2009) tables 6

Empirical specification, example Dutt et al, 2009

► If the Stolper-Samuelson theorem is verified, then trade restriction should increase unemployment in high capital-per-head countries

► Table 4 shows that there is a little support for this theorem: coefficients are insignificant and/or of the wrong sign. Higher tariffs do not lower unemployment in high capital-to-labor-countries, nor does more openness increase it

► Only higher import duties seem to be associated to lower unemployment

► But, the authors show that this result does not hold when the measure of trade is instrumented

Empirical specifications, drawbacks of cross-sections

Cross-section analyses have several limitations:

► They cannot identify how shifts in trade policies impact macroeconomic outcomes within countries over time. For instance, the short-term impact may differ from the long run

► When the data available are in panel form, the basic regression can be augmented with country effects so as to account for time-invariant characteristics

Empirical specifications, advantages and drawbacks of panel data analysis

- ▶ Adding a longitudinal dimension to the analysis, and taking into account the persistence of some macroeconomic outcomes like unemployment or inequality, the measure of trade becomes:

$$y_{it} = \sum_{s=1}^{S} \rho_s y_{i,t-s} + \beta T_{it} + \mathbf{X}_{it}\,\gamma + \mu_i + \varepsilon_{it} \quad (11.27)$$

  - ▶ In this equation, all the previous variables now have a time dimension, so that i is the index for the country and t is index for time
  - ▶ The dependent lagged variable $y_{i,t-s}$ characterizes the persistence of the dependent variable over time
  - ▶ s denotes the total number of lags
  - ▶ μ_i is a country-specific effect
  - ▶ T_i is a measure of trade such as trade openness
  - ▶ $\mathbf{X}_i$ represents a set of controls such as labor market institutions, demography, and the business cycle

Empirical specifications, advantages and drawbacks of panel data analysis

In this setting, the previous problems presented in the cross-sectional framework are still present but take different forms and are dealt with in different ways:

1. The business cycle fluctuations heighten the difficulty of interpreting correlations between trade and unemployment or wages
2. Omitted variables that do not vary over time can be controlled by the country-fixed effects
3. The reverse causality problem is addressed by using the time dimension of data. The measure of trade can be instrumented by past values, which cannot possibly be influenced by the current level of the dependent variable

The time dimension in panel analysis gives rise to autocorrelation of residuals which implies that the OLS estimator is biased

Empirical specifications, advantages and drawbacks of panel data analysis

The Arellano-Bond (GMM) estimator

- ► The method comes down to differencing both sides of equation (11.27) and then look for all instrumental variables for the endogenous variables and use the GMM to estimate coefficient
- ► Considering the equation with only one lagged dependent variable, and temporarily dropping the set of controls **X** to simplify the presentation, we get:

$$\Delta y_{it} = \rho \Delta y_{it-1} + \beta \Delta T_{it} + \Delta \varepsilon_{it}$$

  - ► For any variable x_{it}, $\Delta x_{it} = x_{it} - x_{it-1}$

Empirical specifications, advantages and drawbacks of panel data analysis

Results with panel data

- ► For the panel data analysis, time dummies identify permanent trade liberalization periods: $T_{it} = 1$ after trade liberalization and 0 before
- ► They include the lagged trade liberalization dummies to allow the unemployment to vary over time according to trade policies
- ► The unemployment falls in the wake of trade liberalization, as presented in table 5
- ► Overall, the results of Dutt et al. (2009) show that over the 1985-2004 period, unemployment is correlated negatively not only to international trade across countries but also within countries:
  - ► Trade liberalization episode is associated to a decline in unemployment over time

Empirical specifications, advantages and drawbacks of panel data analysis

	OLS	OLS, FE	GMM	GMM
y_{it-1} = lagged unemployment	.963***	.773***	.616***	.267***
T_{it} = liberalization dummy	.814**	.701*	.925***	.818***
T_{it-1} = lagged liberalization dummy	−.841*	−.664*	−1.983**	−1.346***
T_{it-2} = lagged liberalization dummy	−.756*	−.653*	−.412**	−.838**
Controls (output, demography, labor market)	Yes	Yes	Yes	Yes
labor market participation	No	No	No	Yes
Observations	1096	1096	1011	1011
Number of countries	73	73	72	72

Table 5: The effect of trade policies on the unemployment rate within countries

Note: in the GMM estimates, Trade liberalization and labor force participation are treated as endogenous. Source: Dutt at al. (2009) tables 7

Empirical specifications, advantages and drawbacks of panel data analysis

Main results of other empirical work:

- ▶ Felbermayr et al. (2011b) find that unemployment decreases with trade openness, mostly among skilled workers
- ▶ They also show that more severe labor market search frictions in trading partners increase domestic unemployment. Larger trading partners, and more open economies are more sensitive to their partners' unemployment
- ▶ This tends to invalidate the relevance of the "beggar-thy-neighbor" assumption, by which one country may attempt to remedy its own problems in ways that tend to worsen the problems of its partners

Empirical specifications, trade and productivity

Trade is positively correlated with the average per capita income

- ▸ Frankel and Romer (1999) used a sample of 150 countries to analyze the influence of trade on per capita income in 1985. They instrumented trade in the basic regression of measure of trade by geographical determinants
- ▸ They also controlled for within-country trade, proxied by the size of the domestic market

Empirical specifications, trade and productivity

- ▸ They find that the effect of trade on per capita income is positive and significant, and it rises when trade is instrumented by geographical variables compared with OLS estimates, suggesting that OLS underestimates the effect of trade on unemployment
- ▸ Their estimates imply that a one-percentage-point increase in the trade share raises income per capita by 2 percent
- ▸ Based on the same instrumental approach, Alcala and Ciccone (2004) find a consistent impact of trade on productivity, measured as GDP per worker, and use real openness (imports plus exports relative to purchasing power parity GDP) as a measure of trade. They find that the elasticity of productivity to trade openness is around 1.2

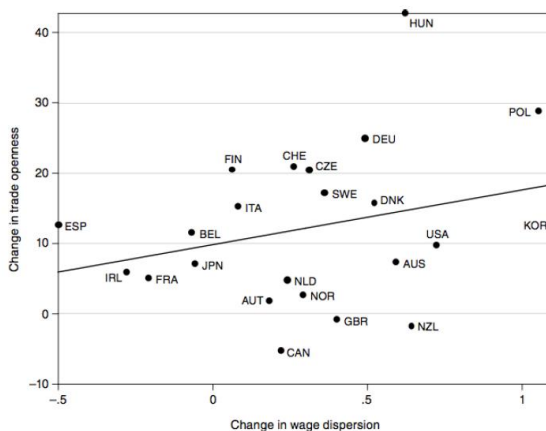## Empirical specifications, trade and wage inequality

FIGURE 11.8
Trends in wage dispersion and trade openness (1985–2007, 23 countries). (Percentage points.)

Note: Trade exposure is a weighted average of export intensity (exports as a % of GDP) and import penetration (imports as a % of domestic demand); wage dispersion is the D9/D1 ratio for full-time weekly earnings. Data start in the mid-1990s for the Czech Republic, Ireland, Hungary, Norway, Poland, Spain, and Switzerland.

Source: OECD (2012, figure 1.5).

Empirical specifications, trade and wage inequality

► The impact of trade on wage inequality is less clear
► Figure 11.8 shows that there is a moderate cross-country positive correlation between changes in trade and changes in wage dispersion
► Table 6 shows that there is no clear correlation between trade and wage dispersion
  ► Wage dispersion is positively associated with technological progress and the share of the population that has attained secondary education
  ► However, labor market regulation does not alter these results
  ► Column 3 and 4 show that disaggregating the overall trade exposure variable into subcomponents does not change these results
  ► Column 5 shows that the region of origin and destination indicate no apparent relation between wage dispersion and imports from emerging economies

Empirical specifications, trade and wage inequality

Dependent var. : *ln* D9/D1 ratio	(1)	(2)	(3)	(4)	(5)	(6)
ln Overall trade exposure	.049	.035				
ln Exports			.038			
ln Imports				−.052		
ln Imports for low/med. income countries					−.017	−.037**
ln Imports from low/med. income countries × dummy for low EPL						.073**
dummy for low EPL			.			.001
ln Union coverage rate		−.039*	−.040**	−.033*	−.039**	−.004
EPL		−.052***	−.052***	−.058***	−.053***	−.066***
ln Tax wedge		−.112***	−.110***	−.106***	−.102***	−.110***
ln Product Market Regulation		−.040**	−.039**	−.041**	−.036**	−.048***
ln Technological change		.097**	.098**	.103**	.093**	.090*
ln % Post-secondary education	−.119*	−.116***	−.120***	−.102***	−.115***	−.089***
Observations	333	333	333	333	333	333
R^2	.45	.55	.55	.55	.55	.57

Table 6: The effect of trade policies on wage inequality in panel of 22 OECD countries.
Note: controls include country and year fixed effects, output gap, and sectorial share of unemployment.
Source: OECD (2012) tables 2.1, and 2.2.

Empirical specifications, trade and inequality, micro-data

▶ Macroeconomic studies previously reviewed have some drawbacks:
  - ▶ Lack of reliable data for developing economies
  - ▶ Difficulty of identifying the impact of trade separately from the impact of other factors that can influence trade
▶ To bypass these drawbacks, some empirical studies have relied on data at the firm or the individual level
▶ Yet identifying the impact of trade at the firm level is a further challenge because many competing factors can influence wages, employment, and job turnover
▶ Moreover, firms that export might have unobserved characteristics or might hire workers with special abilities that also influence wages and turnover

Empirical specifications, trade and inequality, micro-data

- ▶ Bernard and Jensen (1997) analyzed the increased demand for skilled labor and rising wage inequality in the 1980s in the US manufacturing sector, using an exhaustive microeconomic data set on individual establishments over the period 1973-1987 at the plant level
- ▶ They examined if the employment and wage share for nonproduction workers were increasing as a within-plant changes in employment and wages across plants

Empirical specifications, trade and inequality, micro-data

- ▶ They found that while there is evidence that plants were increasing their within-plant share of nonproduction workers, the data suggest that between plant movements contributed to rise in relative wages for nonproduction workers: wage share increases mostly occurred because of shifts across plants
- ▶ They also found that the increase in the wage gap between high-skilled and low-skilled workers can be due to the exporting establishment changes
- ▶ Concerning roles of technological changes and trade on wage inequality, they suggest that the plant-movements of workers and wages, which are important determinants of the increases in the aggregate wage gap, are determined by export-related demand movements across plants

TRADE REORIENTATION UNDER TRANSITION

- Example, trends of trade reorientation after the Fall of Iron Curtain, later followed by an example of empirical exercise investigating causes of the rise in income inequality in CR

The Old System – Trade under central planning

- Centrally planned economies have not been completely closed
- **But:** strict separation of domestic prices and international prices
- State monopoly of foreign trade- special state foreign trade organisations (FTOs) acting as a screen between the foreign partner and the domestic firm (each country around 40-60 of them);
- Western firms usually complained about dealing with FTOs – negotiations could take a long time, but many advantages – usually very loyal partnerships (FTO's liked continuity of business);
- not easy for smaller-medium sized Western firms to get through; FTOs acted as monopsonies – no need to look for many potential buyers;
- Planning of foreign trade:
  - Mandatory output planning for exports
  - Allocation of imports by central planning system
- an excess demand for imports by firms and households
- Central planning system usually tend to balance exports and imports.

The Old System – Trade under central planning

- Intra-COMECON/CMEA trade: bi- and multilateral negotiations about exchange of goods, can be understood as barter trade
  - 'transfer-ruble' as a virtual unit of exchange
  - Some rules for prices: based on world prices calculated as an average of the 5 previous years, and fixed for a duration of 5 years – often exceptions especially from 70s following oil shocks, 1 year rule.
- Trade with other socialist countries accounted for 50-75 % of total foreign trade of each CEECs (the end of 80s).
- Trade with market economies lower than within socialist world
- Trade with market economies: Prices (exchange relations) are determined by goods prices on international markets
- Trade shares much lower than in market economies
- Export bias towards goods with a high resource content
- Arguably, the former USSR did subsidise COMECON partners

Early transition – Trade

Table 9.1 Patterns of foreign trade in the countries in transition: initial changes in direction (1991–3), and shares in 1990, 1993 and 1997

Developed market economies	1991	1992	1993	1990	1993	1997 (prel.)
	Growth rates, in per cent			Structure by direction		
Eastern Europe						
Exports to:						
World	−6.9	−4.0	−0.1	100	100	100
Transition economies	−24.6	−20.6	−7.3	41.1	30.5	26.2
Former Soviet Union	−25.1	−31.7	−14.2	22.3	9.2	10.3
Eastern Europe	−20.1	−8.7	−9.7	12.7	16.7	13.2
Developed market economies	6.6	0.8	1.2	49.5	58.0	66.5
Developing countries	11.8	11.7	5.6	9.4	11.5	7.3
Imports from:						
World	−4.1	3.3	10.4	100	100	100
Transition economies	−19.8	−0.6	4.0	36.8	30.1	23.7
Former Soviet Union	−9.3	−3.4	7.9	18.3	16.1	11.5
Eastern Europe*	−25.8	−3.3	−2.3	12.5	11.9	9.7
Developed market economies	7.8	10.8	12.9	53.3	61.6	67.4
Developing countries	−9.2	−17.6	8.6	9.9	8.3	8.9
*Former Soviet Union/Russia***						
Exports to:						
World	−24.6	−16.8	4.5	100	100	100
Transition economies	−35.0	−14.5	−10.6	25.9	26.3	26.8
Eastern Europe	−40.8	−30.6	−5.1	18.8	17.0	14.4
Developed market economies	−16.2	−14.6	7.6	49.5	59.7	58.1
Developing countries	−29.0	−30.6	11.2	24.6	14.0	15.1
Imports from:						
World	−35.9	−16.8	−27.5	100	100	100
Transition economies	−43.4	−37.4	−32.3	29.4	22.1	18.3
Eastern Europe	−5.6	−51.0	−51.1	23.2	10.7	9.3
Developed market economies	−31.0	−10.8	−29.6	52.9	60.6	67.4
Developing countries	−35.8	11.9	−10.3	17.7	17.3	14.3

* Trade of the Baltic states not included.
** Russia only after 1991.
Source: ECE/UN, 1994a, 1996a, 1998.

Trade Reorientation

Table 8
Trade Reorientation (Share of Exports to Industrial Countries)
Regional Averages: 1990-1998

	1990	1991	1992	1993	1994	1995	1996	1997	1998
BALTIC	6.25	3.70	41.73	42.97	42.52	49.52	46.56	56.82	55.42
BALKAN	43.58	47.70	32.89	38.03	40.17	40.87	44.35	47.81	54.34
VISEGRAD	54.13	64.07	69.46	67.08	68.47	68.78	68.10	69.68	72.96
ASIA	8.40	6.87	17.50	22.44	26.50	23.93	21.53	19.59	23.12
BUR	21.61	18.55	13.76	16.79	28.00	26.42	24.76	24.59	26.60
CEEB	34.65	38.49	48.03	49.36	50.38	53.06	53.00	58.10	60.91
CIS	15.00	12.71	15.63	19.61	27.25	25.17	23.15	22.09	24.86

Source: Campos N.F.; Coricelli F. Growth in Transition: What we know, what we don't and what we should, Trasition Economics, Discussion paper No. 3246

The removal of trade barriers

- Removal of trade barriers between EU and CEECs:
  - Before 1989, the EU granted COMECON countries MFN (Most Favoured Nation) tariff, but no further preferences
  - Quantitative restrictions and frequently anti-dumping activities
  - Free Trade Area for industrial goods agreed in Europe Agreements (EAs=association treaties):
    - Poland, Hungary & CSFR 1991;
    - Bul and Rom in 1993;
    - Baltic states 1995;
    - Slovenia in 1996;
  - Asymmetric removal of tariffs and a movement towards establishment of a free trade area between each CEEC and EU within 10 years since the entry of the EAs into force.
  - Agreements on industrial goods only; Sensitive goods e.g. textile, iron, steel products, chemicals, footwear, furniture, motor vehicles…

The removal of trade barriers

- However the framework of Europe Agreements did not apply to a range of products:
  - Agricultural goods (ruled by CAP – agriculture generally excluded from envisaged free trade area);
  - Some textile goods (regulated by Multi-Fibre Arrangement);
  - Coal and steel products (regulated by the ECSC)

- To sum up: the market access provided in Europe Agreements not as generous as it seems:
  - The more sensitive products amounted to dominant share of export from CEECs – see Fig. on the next slide;
  - Both parties can use anti-dumping and safeguard procedures – more help to EU against the flow of low-price imports from the East.
  - Rules of origin strictly defined - products qualifying for trade concessions must be produced in the CEECs and must not have more than 40 % of import content (barrier for investments into the CEECs from e.g. U.S and Japan).

The removal of trade barriers

Table 9.4   Trade in sensitive products between the EC countries and five countries in transition in 1992

Commodity groups (according to sections of EC Common Tariff)	Five CEECs	Poland	CSFR	Hungary	Romania	Bulgaria
– Agricultural goods (including processed): share in total exports to EC (in percent)	12.3	13.4	5.0	20.8	5.5	20.4
– balance of the CEECs (exports minus imports), in million ECU	+301	+28	−141	+602	−248	+59
Chemical products:						
– share in total exports to EC (in per cent)	5.7	5.6	6.2	5.5	4.1	7.7
– balance of the CEECs (exports minus imports), in million ECU	−1,012	−492	−175	−234	−67	−44
Textiles:						
– share in total exports to EC (in per cent)	16.5	15.7	12.0	16.5	35.2	22.1
balance of the CEECs (exports minus imports), in million ECU	+749	+170	+244	+104	+170	+62
Base metals and articles:						
– share in total exports to EC (in per cent)	16.1	18.9	18.2	10.4	10.7	15.2
– balance of the CEECs (exports minus imports), in million ECU	+1,869	+886	+630	+178	+78	+99
Total sensitive products:						
– share in total exports to EC (in per cent)	50.6	53.6	41.4	53.2	55.5	65.3
– balance of the CEECs (export minus imports), in million ECU	+1,907	+592	+558	+650	−67	+176
Total trade:						
– total exports to EC (in per cent)	100.0	100.0	100.0	100.0	100.0	100.0
– total balance of the CEECs (exports minus imports), in million ECU	−2,541	−1,071	−728	−74	−452	−215

EC = European Community
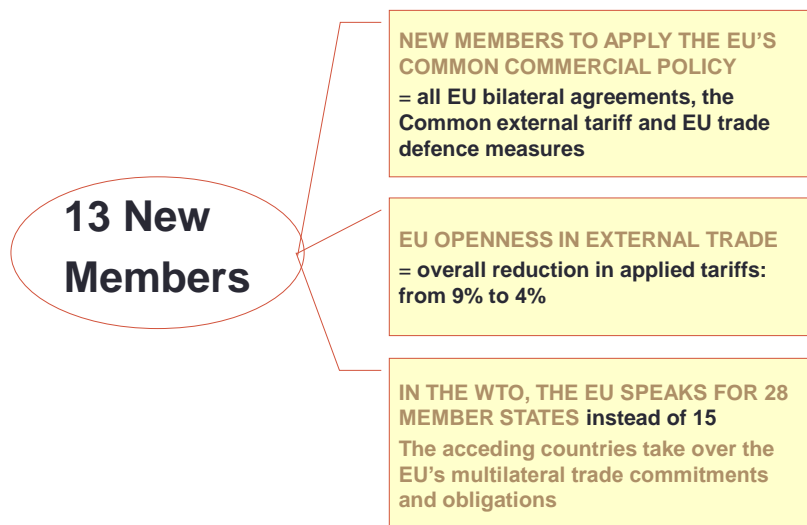CEEC = Central and Eastern European countries
Source: Calculations from D. Mario Nuti, 'The Impact of Systemic Transition on the European Community (Table 7), in Stephen Martin (ed.). The Construction of Europe – A Festschrift in Honour of Emile Noel, Berlin: de Gruyter, 1994.

The removal of trade barriers

Integration into the Single Market (much more than just tariffs):

- CEEC-8, Malta and Cyprus 2004
- Bulgaria and Romania 2007
- Croatia 2013
- adoption and enforcement of acquis communautaire
- but transitional periods:
  - free movement of labour (2+3+2)
  - Restrictions to freedom in providing services in 'sensitive sectors'
    - E.g. Austria, Germany – Construction, Industrial Cleaning, activities of interior decorators, Home nursing, ...
  - land ownership
    - in 2009 end of restrictions in majority of new members

Common Commercial Policy adopted by the new EU members

13 New Members

NEW MEMBERS TO APPLY THE EU'S COMMON COMMERCIAL POLICY
= all EU bilateral agreements, the Common external tariff and EU trade defence measures

EU OPENNESS IN EXTERNAL TRADE
= overall reduction in applied tariffs: from 9% to 4%

IN THE WTO, THE EU SPEAKS FOR 28 MEMBER STATES instead of 15
The acceding countries take over the EU's multilateral trade commitments and obligations

Common Trade policy, Common defense measures: What are trade defense measures?

- Trade defence is one of the areas of the EU Common Commercial Policy. In general, the EU applies three types of trade defiance measures:
  - anti-dumping,
  - anti- subsidy
  - safeguard measures - may be applied to imports that increase in such quantities and are made under such conditions as to cause or threaten to cause serious injury to the Community industry, provided there is a Community interest to do so. Instruments:
    - quotas, e.g. footwear, tableware and ceramics from China;
    - import licensing

Trade defense measures typically take the form of additional duties payable by the importer upon the importation of the relevant good. Currently, measures on approximately 60 goods originating in more than 30 countries are in place. They concern less than 0.5% of total imports of products into the EU.

EU-27 trade patterns

EU27 exports and imports by main partner
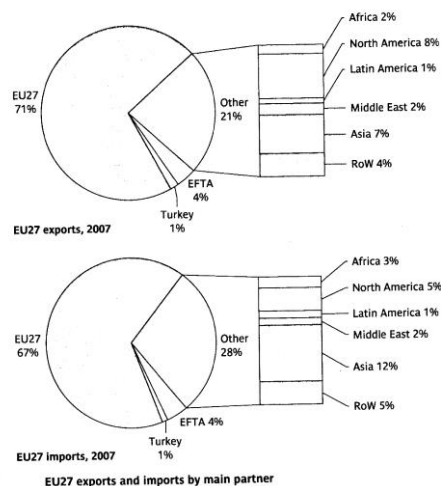
EU-27 trade patterns

The EU's top ten import and export partners

United States	226	26%	United States	157	17%
Switzerland	71	8%	China	105	11%
China	41	5%	Japan	72	8%
Japan	41	5%	Russia	68	7%
Russia	37	4%	Switzerland	59	6%
Turkey	29	3%	Norway	51	5%
Norway	28	3%	Turkey	26	3%
Canada	22	2%	South Korea	26	3%
Hong Kong	18	2%	Taiwan	22	2%
Australia	18	2%	Brazil	19	2%
United Arab Emirates	16	2%	Canada	16	2%
South Korea	16	2%	Malaysia	16	2%

United States	261	22%	China	231.51	16%
Switzerland	93	8%	United States	181.1	13%
Russia	89	7%	Russia	143.88	10%
China	72	6%	Japan	78.1	5%
Turkey	53	4%	Norway	76.83	5%
Japan	44	4%	Switzerland	76.7	5%
Norway	43	4%	Turkey	46.86	3%
India	29	2%	South Korea	39.61	3%
United Arab Emirates	27	2%	Brazil	32.65	2%
Canada	26	2%	Libya	27.32	2%

Source: Eurostat © European Communities 1995–2009

Empirical evidence, wage inequality, micro data

- Example, Eriksson, Pytlikova and Warzynski (EoT2013) –effects of trade on income inequality using matched employer employee data from CR

Changes in Wage Inequality in the Czech Republic – new evidence using linked employer-employee data

(Eriksson, T., Pytlikova, M. and F. Warzynski, Econ of Transition, 2013)

Motivation

- Substantial increase in wage inequality
- Few studies of labour market dynamics for post-transition period
- Czech Republic one of ten new EU member states
- Increased competition due to deregulation
- How have these changes affected the Czech wage structure?
- Examine changes in Czech wage structure in the late transition and post-EU accession years (1998-2006)
- Use the private sector part of a linked employer-employee data set. Firms with more than 9 employees

Motivation

- Several significant changes that might have an effect on Czech wage structures:
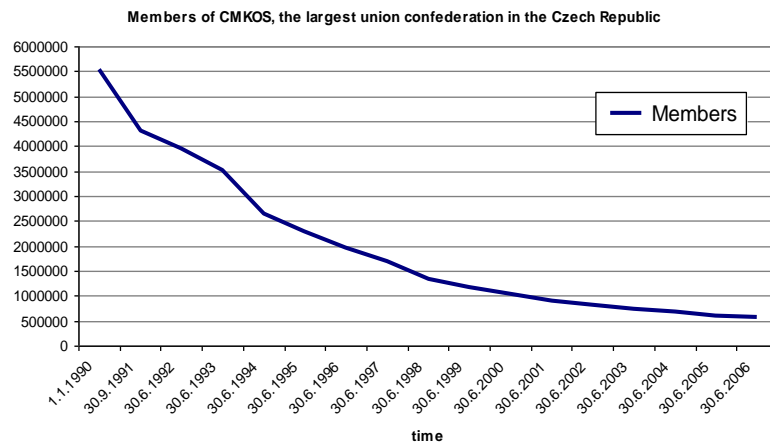 - *Increasing competition*
  -

Motivation

- Several significant changes that are likely to contribute to changes in Czech wage structures:
  - *Increasing competition*
    - ➢ via "domestic/inside" factors:
      - ➢ *Privatisation* and break-ups of large state industries;
      - ➢ *Deregulations* of several markets;
      - ➢ *New start-ups*;
      - ➢ *Inflow of companies from outside;*
    - ➢ from "outside":
      - ➢ *Trade liberalisation;*
      - ➢ *Entrance to the EU;*

Motivation

- Several significant changes that are likely to contribute to changes in Czech wage structures:
  - *Increasing competition*
  - *Decentralization in wage bargaining process*
-

Motivation

Members of CMKOS, the largest union confederation in the Czech Republic

Motivation

- Several significant changes that are likely to contribute to changes in Czech wage structures:
  - *Increasing competition*
  - *Decentralization in wage bargaining process*
  - *Skill mismatches*
  -

Motivation

- Several significant changes that are likely to contribute to changes in Czech wage structures:
  - *Increasing competition*
  - *Decentralization in wage bargaining process*
  - *Skill mismatches:*
    - ➤ Process of economic transition;
   - ➤ global phenomenon of Skill-Biased Technological Changes (SBTC);

Motivation

- Several significant changes that are likely to contribute to changes in Czech wage structures:
  - *Increasing competition*
  - *Decentralization in wage bargaining process*
  - *Skill mismatches*
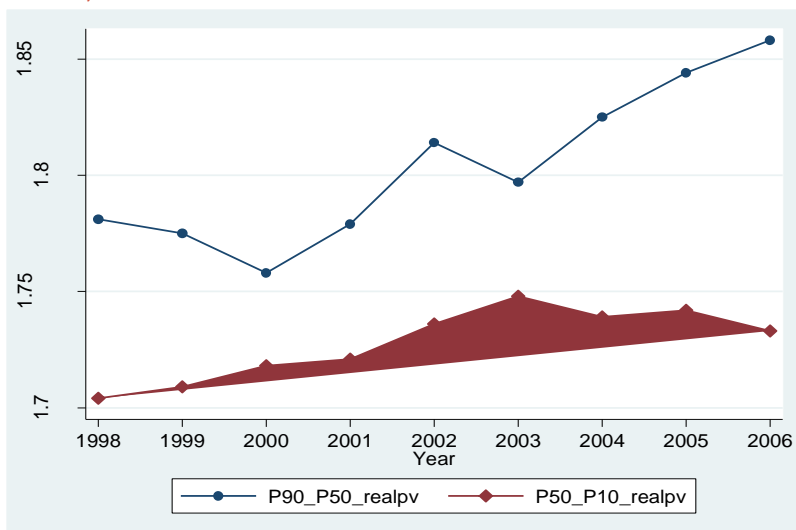 - *Increases in minimum wage and minimum wage tariffs.*

-

Hypotheses

- *Increasing competitiveness*
- =>between-firms wage inequality ↘ ;

- *Decentralization in wage bargaining process*
- ↑ => in variability of firm-specific component of wages;
- ↑ => in both within- and between-firms wage inequality;

- *Skill mismatches:*
- ↑ => returns to both observable and unobservable skills;
- ↑ => within-firm inequality;

- *Increases in minimum wage and minimum wage tariffs*
- => flattening of wage distribution at the lower end or shifting the entire distribution
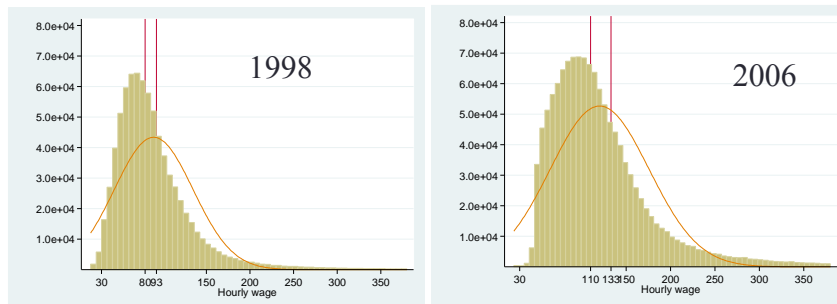
Changes in real hourly wage inequality P90/10-ratio, 1998-2006
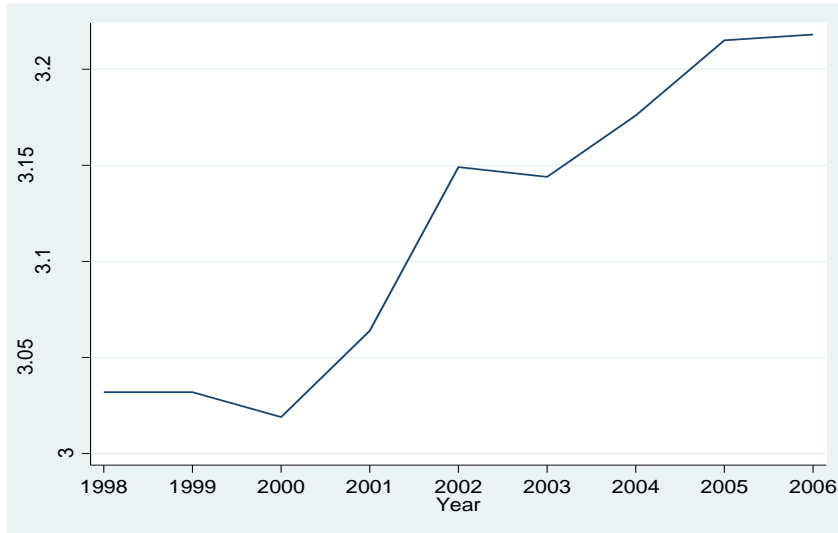
Changes in real hourly wage inequality P90/50- and P50/10-ratios, 1998-2006

Wage distributions in 1998 and 2006, real hourly wage

Hypotheses

- ➢ *Increasing competition* erodes firms' product market rents ➔ reduced wage dispersion between employers. Impact on within-firm inequality is ambiguous.

- ➢ *Decentralisation of wage bargaining process* removes constraints on firm-specific bargaining, increases local bargaining power ➔ increase in both within- and between-firm wage inequality

- ➢ *SBTCH - Skill mismatches* lead to an increase in returns to observable as well unobservable skills and in within-firm wage inequality -> also *Sorting by education*

- ➢ *Increases in minimum wage and minimum wage tariffs* ➔ compression of lower end of wage distribution

- ➢ *Sorting by education*

Data

- Source: TREXIMA. Private firm, provider of data to Czech Ministries
  - Linked employer-employee data set 1998-2006
  - Size restriction: private sector and min 10 employees:
  - 1609 firms (unbalanced)=around 1 mil obs yearly;
  - High quality information on:
    - wages,
    - detailed employee characteristics (age, gender, education, tenure, occupation)
    - firm characteristics (industry, region, ownership, size, information on unions, profits, sales,..)
- From Czech statistical office – info on exports and imports by 3-digit NACE industry, so we can create competition measures.

Econometric analysis

- **Step 1: Mincerian Regressions**
- We run standard Mincerian earnings equation and look at the evolution of our parameters over time. The equation has the following form:

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

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

- Focus on returns to:
  - experience,
  - tenure,
  - education, and on
  - the gender wage gap

Results

	1998	1999	2000	2001	2002	2003	2004	2005	2006
Age	.036	.043	.040	.036	.036	.036	.038	.039	.039
Female	-.250	-.242	-.229	-.230	-.230	-.225	-.222	-.215	-.219
No or primary education	-.281	-.399	-.254	-.250	-.305	-.380	-.272	-.310	-.243
University education	.573	.563	.588	.604	.633	.623	.605	.616	.615

Other regressors: several educational dummies, industry, region and ownership dummies

Summary of results from Mincerian equation

- Few changes in returns to observables.
- Returns to schooling were increasing til 2002 then declined slightly;
- Gender gap has decreased;
- Rising returns to experience – age and tenure
- Add tenure (available from 2002) → no change in other estimates
- Add firm fixed effects → no change in other estimates

Evolution of between- and within- firm wage inequality

Step 2: Within and Between-Firms Wage Inequality

=> Decompose the evolution of wage inequality into within firm and between-firm wage inequality.

Real Wage Inequality	1998	1999	2000	2001	2002	2003	2004	2005	2006
Within-Firm									
St.Dev.	48.36	49.01	49.08	52.21	55.66	62.92	63.49	65.32	76.19
Between-Firms									
St.Dev.	48.72	43.31	41.58	44.10	48.72	56.02	54.21	55.35	63.86

Evolution of between- and within- firm wage inequality

•Within-firm real wage inequality has increased,

•And so did between-firm inequality although not as much as within-firm inequality.

=> Next, we try to explain what drives the within- and between-firm wage inequality.

Explaining Within-Firm Wage Inequality, 1998-2006

Dep.Var.:	(1)	(2)	(3)	(4)
	Within- Firm St. Dev. of Hourly Wage			
Export Intensity	-0.559	3.489	0.139	20.459
	[1.619]	[4.837]	[3.175]	[11.713]
Import Penetration	-0.466	-0.695	-0.084	-14.558
Ratio	[0.621]	[0.630]	[0.472]	[10.327]
Average Industry	87.447***	39.722***	22.095**	40.656**
Profit Margin	[11.749]	[14.245]	[10.984]	[20.717]
Log Labor	10.806***	9.760***	4.129***	12.603***
Productivity	[0.622]	[0.699]	[1.019]	[1.052]
Foreign	11.908***	10.806***	3.833	10.888***
	[1.346]	[1.372]	[2.117]	[1.804]
Log Size	2.672***	2.990***	1.330	2.736***
	[0.466]	[0.507]	[1.712]	[0.764]
Share of	113.522***	155.871***	182.552***	163.837***
University Edu	[5.730]	[7.986]	[15.974]	[11.972]
Coll. Agreement	-	-	-	2.249
(Y/N)	-	-	-	[1.967]
Industry dummies	NO	YES	-	YES
Firm dummies	NO	NO	YES	NO
Constant	-23.045**	-25.693**	12.443	-45.592
	[8.014]	[9.067]	[20.694]	[38.442]
Observations	4938	4938	4938	3108
R-squared	0.288	0.341	0.685	0.330

Explaining Between-Firm Wage Inequality, 1998-2006.

Dep.Var.:	(1)	(2)	(3)
	Between- Firm St. Dev. of Average Hourly Wage (Within industry)		
Export Intensity	-3.619	0.495	-1.210
	[1.913]	[2.828]	[5.653]
Import Penetration	-1.296	-1.035	-0.555
Ratio	[1.469]	[1.133]	[4.207]
Average Industry	31.299***	-0.610	5.902
Profit Margin	[9.037]	[7.879]	[10.369]
Std. dev. in log	0.052***	0.060***	0.056***
Labor Productivity	[0.010]	[0.008]	[0.009]
Average Share of	2.608	2.890	3.227
Foreign Firms	[2.982]	[3.735]	[4.578]
Std. dev. in	0.971	2.762	3.403
log Firm Size	[0.678]	[1.473]	[2.269]
Std. dev. in Share	239.530***	226.326***	236.157***
of University Educated Employees	[10.127]	[11.338]	[14.425]
Coll. Agreement	-	-	-6.003
(Y/N)	-	-	[3.824]
Industry dummies	NO	YES	YES
Firm dummies	-	-	-
Constant	2.708	-10.241	-5.824
	[4.428]	[9.329]	[14.415]
Observations	580	580	414
R-squared	0.611	0.810	0.822

Explaining within-firm and between-firm wage (within industries) inequality, 1998-2006, Summary of results

•We find that:

- within firm wage inequality is strongly associated with foreign ownership and the share of college educated individuals.
- On the other hand, the (within sector/industry) between firm inequality is mostly explained by differences in the standard deviation of the share of college educated workers within firm

•Our main findings suggest therefore that the changing **educational composition both within and between firms within industries is the most important engine driving increased inequality in the CR.**

•->the sorting can be result of increased competition as well as competition make firms adapt new technology ->firms hire more educated workers to work with the technology => increased educational sorting within and between firms

Explaining within-firm and between-firm wage (within industries) inequality, 1998-2006, Summary of results

Other important factors are:

- the increase in foreign ownership, contributing to more within-firm inequality.
- we find that higher import penetration is associated with lower within-firm wage inequality.
- We also find that higher average profit margins at the industry-level are associated with higher within-firm inequality.
- These two latest findings could be related to Syverson (2004) who finds that **more product market competition leads to lower productivity dispersion, which might in turn be associated with less wage dispersion**.

Empirical evidence, effect of trade on wages

Effect of Trade on Wages:

- Earlier literature uses macro – country, industry, regional data,
- nowadays more micro approach - matched employer-employee data more common:
- EXAMPLE presentation of Jens Suedekum: Adjusting to Globalization-evidence from Worker-Establishment Matches in Germany
- use the Sample of Integrated Labour Market Biographies (SIAB) from the German Institute for Employment Research (IAB) –a random 2%
- construct a balanced 11-year panel for each of workers between 22 and 54 years old in manufacturing sector,
- Focus on annual earnings relative to worker's earnings in base year (1990, 2000)
- All individual and firm controls..
- Trade data UN commodity trade statistics database (COMTRADE) at 3 digit industry NACE level to create import and export exposure

Empirical evidence, trade on wages, micro data

Effect of Trade on Wages:

- Suedekum, J. et al 2016 *Findings*:
- Rising import penetration reduces cumulative earnings over ten years by about 1,8 %, while rising exports lead to an increase by about 2,2,%. Import penetration induces workers to leave the exposed industries. Intra-industry mobility to other firms or regions are less common adjustments. This induced industry mobility mitigates the adverse impacts of import shocks in the workers' subsequent careers, but their cumulated earnings over a longer time horizon are still negatively affected. They find much less evidence for sorting into export-oriented industries, but the earnings gains mostly arise within job spells.

Policy Issues

➢ Since enhanced trade does displace some workers in a society, normative considerations require that those who gain from reducing the barriers to international transaction compensate those who lose from this policy change.

Policy Issues

Subsidizing Human-Capital Investments

➢ Those workers who are displaced by enhanced trade experience spell of unemployment and they may have to:

- Invest in training to qualify for another job
- Invest in moving to a new city or state to secure employment

➢ Government programs that subsidize these human-capital investments, if paid for by those who gain from expansion of international transactions, can have two important purposes:
- Compensate workers who are displaced due to policy change
- Help displaced workers qualify for and find new jobs

TUESDAY 22.3. 9-10.30

Active labour market policies; Unemployment benefits

Retirement and aging; Early retirement plans