

# International evidence regarding the labour market impact of immigration: lessons from meta-analysis

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# Motivation

- International migration is an increasingly important component of population change in most countries. The total number of people living outside country of birth now exceeds 200 million
- The growth rate is high: the number has doubled since the 1960s
- “New migration paradigm”: patterns of trans-national living and working are becoming more complex
- Empirical evidence on integration of immigrants and “spillover effects” on the host population inform immigration policy
- Up to the 1980s, immigration research was conducted almost exclusively in the “New World” countries. Emigration research focussed on the “brain drain” in developing countries. Now a huge body of literature has emerged on the economics of international migration.
- The existing body of empirical evidence suggests that the **labour market** impact of migration is benign/minor. This “research puzzle” is gradually being resolved.

# Why meta-analysis?

- Permits synthesis despite increasing diversity of studies (particularly where data pooling is not feasible and greater precision in statistical inference is desired)
- Cost saving when results are “transferable”
- Systematic tool to help to design the next study
- Less subjective and more transparent than narrative literature review
- Global availability of large data sets through the internet encourages replication and re-analysis: the 'flood of numbers'
- Literature searches have become much easier and coverage more complete
- Useful in both experimental and, with modification, in non-experimental settings

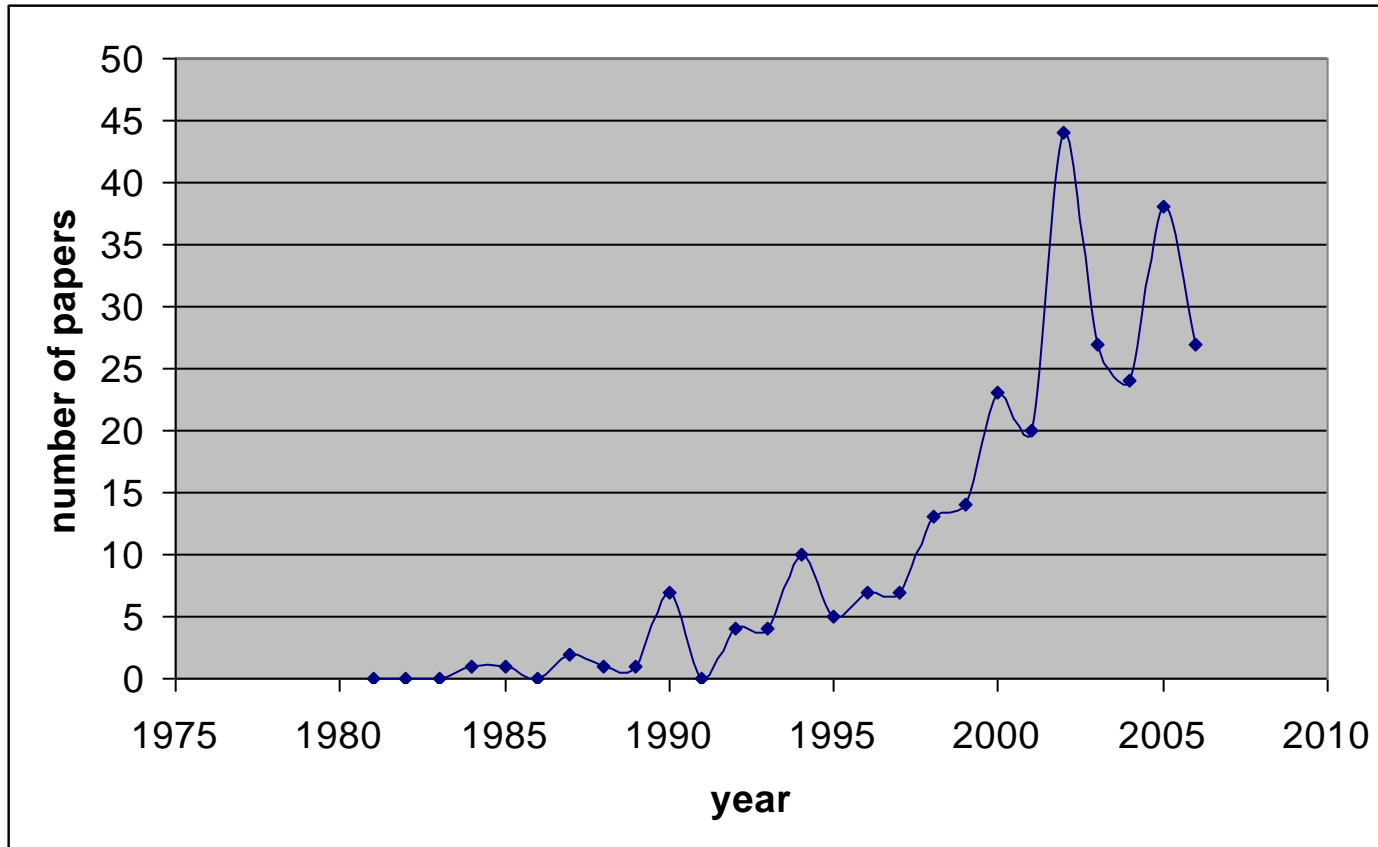
# A Definition of Meta-analysis

“Meta-analysis refers to the statistical analysis of a large collection of results from individual studies for the purpose of integrating the findings. It connotes a rigorous alternative to the casual, narrative discussions of research studies which typify our attempt to make sense of the rapidly expanding research literature.”

Gene V Glass (1976) “Primary, secondary, and meta-analysis of research”, *Educational Researcher* 5: 3-8.

Good introduction in economics: special 2005 issue (vol. 19, no. 3) of *Journal of Economic Surveys*

# Exponential growth of meta-analysis in economics



# Meta-analysis of the labour market impacts of immigration

- Longhi et al. (2005) *JEcSurveys* analysed 348 estimates of the wage impact of immigration, derived from 18 papers
  - A 1% increase in the number of immigrants, when they are about 10% of the population, decreases wages of natives on average by 0.01%
- Longhi et al. (2005) *JMigRefIssues* analysed 165 estimates of the employment impact of immigration, derived from 9 papers
  - A 1% increase in the number of immigrants, when they are about 10% of the population, decreases employment of natives on average by 0.02%
- Motivation for Longhi et al. (2008) *Région et Développement* paper:
  - The selected past studies may be 'atypical'. There is a need to compare more studies and 'pool' outcomes on wages, employment, unemployment and labour force participation
  - Study characteristics affect study conclusions. Are such relationships different across different types of labour market outcomes?

# The Primary Studies

- Primary study regressions have the specification:

$$y_i = \beta m_i + \mathbf{x}_i \alpha + \varepsilon_i$$

$y_i$  either **wages**, **employment**, **unemployment** or **labour force participation** of the native born or of earlier immigrants, or a **change** in one of these four variables

$m_i$  either the **stock** of immigrants, or the **share of immigrants** in the population, or a **change** in one of these two variables (i.e. immigration flows)

$\mathbf{x}_i$  row vector of the values of the covariates for observation  $i$

$\varepsilon_i$  stochastic error term

Variable of Interest:  $\beta$  (Effect Size)

# The dilemma of meta-analysis

- Comparison of estimates of  $\beta$  is only possible when the units of measurement are the same across studies, or when  $\beta$  can be converted to comparable quantities, such as elasticities
- The more comparable the studies are, the fewer the number of studies that we can compare
- When there are few directly comparable studies, we can take a more qualitative approach and focus on statistical significance, i.e.  $t$  stats or  $p$  values
- For policy, the difference between statistical significance and economic significance is important!

# International migration changes labour supply. What would we expect?

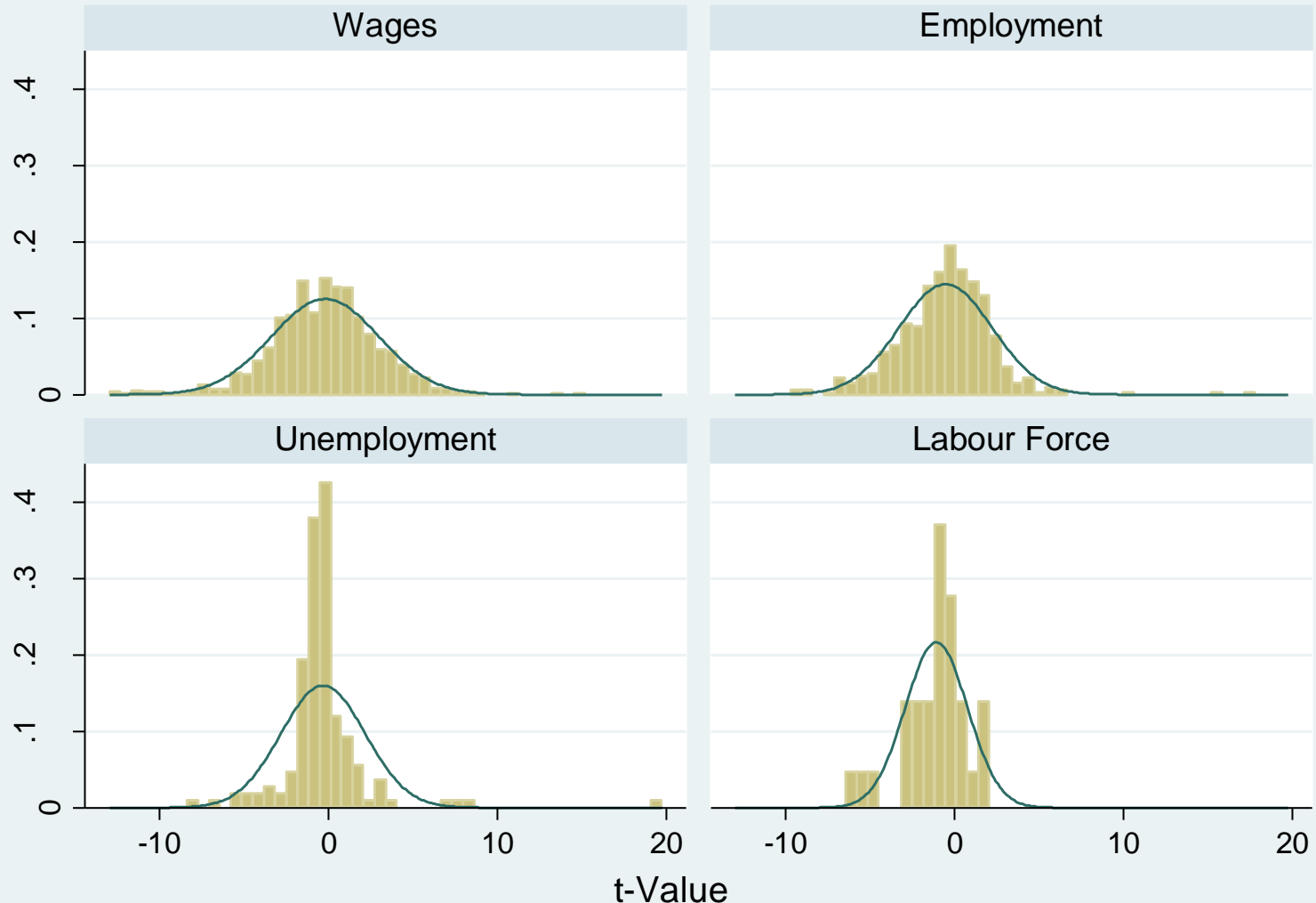
- **Standard model for host labour market when immigrants and natives in host countries are close substitutes:**
  - A decrease in wages
  - An increase in employment overall, but a decrease in employment of the native born
  - A decrease in labour force participation
  - An increase in unemployment
- Impact on the sending country/region would be “the opposite”
- **If migrants and natives are NOT close substitutes, a general equilibrium model suggests that wages and employment of the natives in host countries increase: “the paradox of diversity”**
  - Impact on the sending country/region depends on the “selectivity” of migration
  - Overall impact depends on convergence or divergence (World Bank *World Development Report 2009*)
  - Ozgen, Nijkamp & Poot (2009): internal migration contributes to agglomeration and therefore core-periphery divergence

# The sample of data for meta-analysis

- 45 Primary studies
- 1572 Effect Sizes of the impact of immigration
  - 854 on wages; 500 on employment; 185 on unemployment (but 86 from the same primary study); 33 on labour force participation
  - 923 on the US; 490 on EU countries (Austria, France, Germany, Netherlands, Norway, Portugal, Spain, and UK); 195 on other countries (Australia, Canada, and Israel)
- Each effect size is the  $t$  statistic on coefficient of the immigration variable in a primary regression specification

# Effect sizes and study characteristics

Study Characteristic		Labour Market Effect			
		(1) Percent $t \leq -1.96$	(2) Percent $-1.96 < t < 1.96$	(3) Percent $t \geq 1.96$	Total
	All	24.9	58.1	17.0	1572
Type of Publication	Journal	29.6	52.6	17.8	652
	Book	17.0	65.2	17.9	112
	Working Paper	22.2	61.5	16.3	808
Year of Publication	1980s	33.3	47.1	19.6	51
	1990s	18.7	59.1	22.2	433
	2000s	26.9	58.2	14.9	1088
Labour Market Impact	Wages	26.8	51.4	21.8	854
	Employment	26.0	60.2	13.8	500
	Unemployment	12.4	81.6	5.9	185
	Labour Force Participation	27.3	66.7	6.1	33
Country	US	23.8	54.6	21.6	923
	EU	20.8	67.8	11.4	490
	Others	40.5	52.8	6.7	195
Size of the Area	Big	26.8	59.2	14.0	893
	Small	15.8	74.7	9.5	95
	Very Small	23.5	53.6	22.9	584
Approach	Data Driven	27.1	56.3	16.7	942
	Economic	19.0	59.2	21.8	179
	Natural Experiment	22.6	61.4	16.0	451
Impact on	Everybody	16.7	65.3	18.1	72
	Natives	27.0	57.0	16.0	1244
	Immigrants	16.8	61.3	21.9	256
Natives' Skills	Everybody	31.7	55.9	12.4	914
	High	12.9	60.7	26.4	326
	Low	17.8	61.4	20.8	332
Kind of Data	Cross Section	33.6	49.0	17.4	822
	Pooled	15.3	68.0	16.7	750



Graphs by Dependent variable in the primary regressions

# Why are all these t-statistics so close to zero, i.e. why are labour market outcomes relatively unaffected?

- The important role of capital
- Immigrants and natives are not close substitutes in production
- Firms change the product mix: industries that use immigrants more intensively expand
- Firms change the production technologies to those that use immigrants more intensively (Dustmann and Glitz 2008: accounts for 2/3 of 'absorption' of immigrants)
- Immigration increases the demand for local non-traded services
- The impact is offset by natives leaving the area
- The biggest impact is on earlier immigrants

# Methodology to identify “important” study characteristics: an ordered probit model

$$b_i^* = \mathbf{s}_i \lambda + \zeta_i$$

$b_i^*$  = latent process, for which we observe

when  $b_i^* \leq \mu_1$  then  $\mathbf{b} = -1$  ( $t$  is negative and statistically significant) (immigration has a negative impact);

when  $\mu_1 < b_i^* < \mu_2$  then  $\mathbf{b} = 0$  ( $t$  is statistically insignificant) (inconclusive impact);

when  $b_i^* \geq \mu_2$  then  $\mathbf{b} = +1$  when  $t$  is positive and statistically significant (immigration has a positive impact);

$\mu_1$  and  $\mu_2$  are estimated within the model

$\mathbf{s}_i$  = characteristics of the primary studies and effect sizes

# An alternative effect size measure: Fisher's $Z^r$ statistic

This is based on the partial correlation coefficient  $r_i$  derived from regression equation  $i$ :

$$r_i = \frac{t_i}{\sqrt{t_i^2 + df_i}}$$

in which  $t_i$  is the  $t$  statistic and  $df_i$  the degrees of freedom of the regression equation. The Fisher  $Z^r$  statistic is then calculated as

$$Z_i^r = \frac{1}{2} \ln \left( \frac{1+r_i}{1-r_i} \right)$$

The asymptotic standard error of the  $Z^r$  statistic is given by

$$se_{Z_i^r} = \sqrt{\frac{1}{N_i - 3}}$$

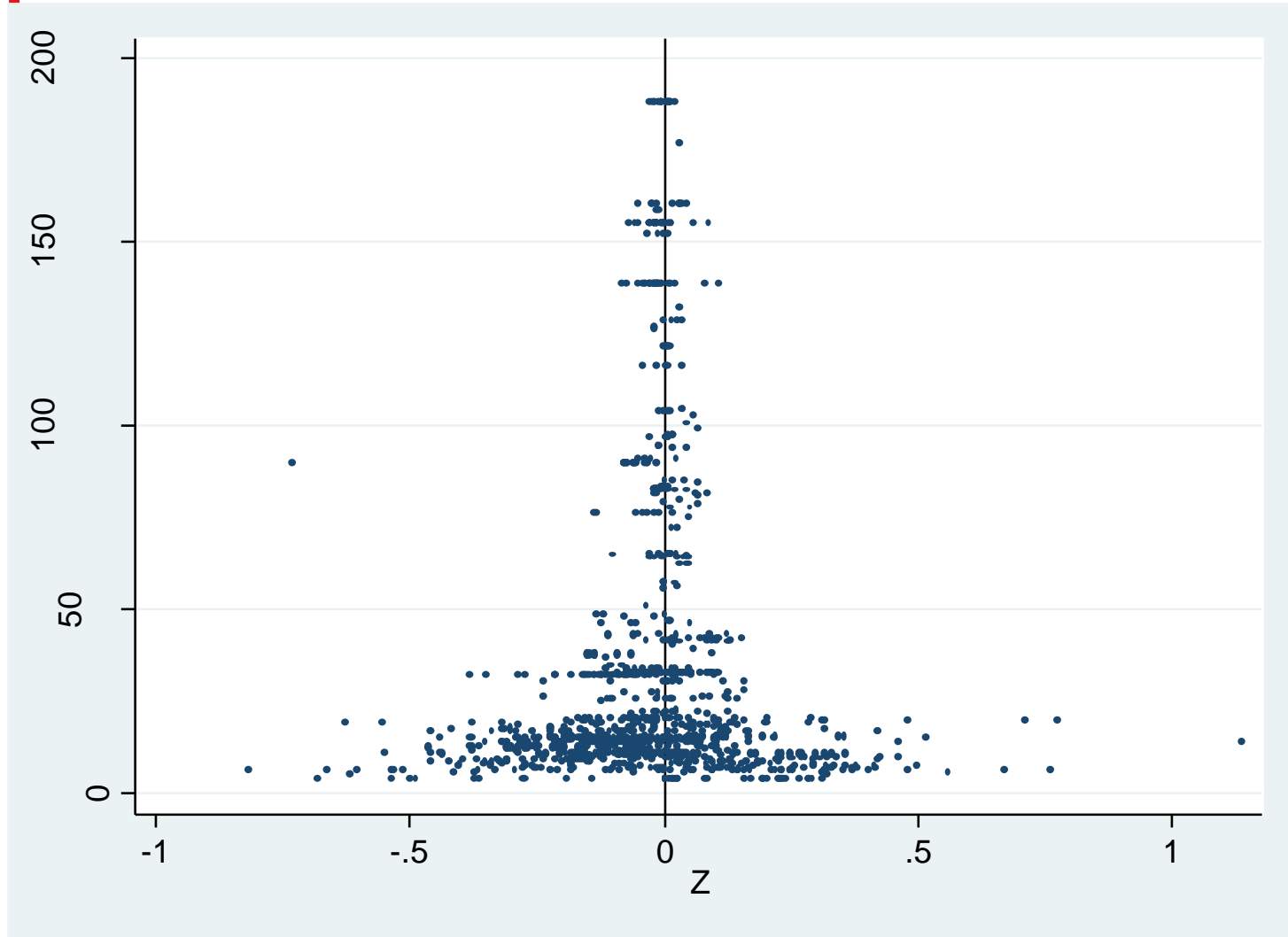
# Alternative methodology to identify “important” study characteristics: a WLS regression model

These are models of the form

$$Z_i^r = \mathbf{x}_i\boldsymbol{\beta} + \varepsilon_i$$

in which the vector  $\mathbf{x}_i$  again represents the characteristics of the study that yielded effect size  $i$ .

# The funnel plot suggests little evidence of publication bias



# Type of Labour Market Impact

Marginal effects: All Effect Sizes

	P(b = -1)	P(b = 0)	P(b = 1)
E	0.066***	-0.023***	-0.043***
U	-0.010	0.003	0.007
LFP	0.126**	-0.068	-0.058***

W = Wages (reference category); E = Employment; U = Unemployment; LFP = Labour Force Participation (\* Significant at 10%; \*\* 5%; \*\*\* 1%)

# Country

P(b = -1)

P(b = 0)

P(b = 1)

Marginal effects: **All** Effect Sizes

EU	0.033	-0.010	-0.021
Others	0.113**	-0.054*	-0.059***

Marginal effects: **Wages**

EU	-0.035	0.003	0.032
Others	0.172***	-0.071**	-0.101***

Marginal effects: **Employment**

EU	0.053	-0.035	-0.017
Others	0.039	-0.027	-0.012

Reference category: Effect Sizes using Data for the US

(\* Significant at 10%; \*\* 5%; \*\*\* 1%)

## Geographical Size of the Labour Market

	P(b = -1)	P(b = 0)	P(b = 1)
Marginal effects: <b>All</b> Effect Sizes			
Big	0.051*	-0.013**	-0.038*
Small	0.080*	-0.036	-0.043**
Marginal effects: <b>Wages</b>			
Big	0.105***	-0.008	-0.097***
Small	0.221**	-0.117	-0.104***
Marginal effects: <b>Employment</b>			
Big	-0.006	0.003	0.002
Small	0.052	-0.037	-0.015

Reference category: Effect Sizes Computed on Very Small Areas (e.g. SMSAs)

(\* Significant at 10%; \*\* 5%; \*\*\* 1%)

# Natives vs. Earlier Immigrants

	P(b = -1)	P(b = 0)	P(b = 1)
Marginal effects: <b>All</b> Effect Sizes			
Everybody	-0.085***	-0.005	0.090*
Immigrants	0.058*	-0.023	-0.035**
Marginal effects: <b>Wages</b>			
Everybody	-0.078	-0.013	0.091
Immigrants	0.094**	-0.029	-0.065**
Marginal effects: <b>Employment</b>			
Everybody	0.158***	-0.094***	-0.064**
Immigrants	-0.040	0.023	0.017

Reference category: Effect Sizes Computed on Natives

(\* Significant at 10%; \*\* 5%; \*\*\* 1%)

# Estimation Approach

	P(b = -1)	P(b = 0)	P(b = 1)
Marginal effects: <b>All</b> Effect Sizes			
Economic	-0.052*	0.007**	0.045
Natural Exp.	-0.044*	0.010**	0.034*
Marginal effects: <b>Wages</b>			
Economic	-0.099**	-0.014	0.113*
Natural Exp.	-0.064*	0.003	0.061*
Marginal effects: <b>Employment</b>			
Economic	-0.010	0.006	0.004
Natural Exp.	-0.117**	0.069**	0.048**

Reference category: Effect Sizes Computed using the 'Area Approach' (Data Driven)  
(\* Significant at 10%; \*\* 5%; \*\*\* 1%)

# Type of Publication

P(b = -1)

P(b = 0)

P(b = 1)

Marginal effects: **All** Effect Sizes

Book	0.080*	-0.036	-0.045**
Work. Paper	-0.034	0.009	0.025

Marginal effects: **Wages**

Book	0.150*	-0.066	-0.084***
Work. Paper	0.029	-0.005	-0.024

Marginal effects: **Employment**

Book	0.127	-0.098	-0.029**
Work. Paper	-0.165***	0.101***	0.064***

Reference category: Primary Study Published in Academic Journal

(\* Significant at 10%; \*\* 5%; \*\*\* 1%)

## Year of Publication

P(b = -1)

P(b = 0)

P(b = 1)

Marginal effects: **All** Effect Sizes

1990s	-0.052	0.011	0.041
2000s	-0.015	0.005	0.011

Marginal effects: **Wages**

1990s	-0.123**	-0.006	0.129*
2000s	-0.180*	0.052	0.128**

Marginal effects: **Employment**

1990s			
2000s	0.209***	-0.052*	-0.158***

Reference category: Primary Studies Published in the 1980s

(\* Significant at 10%; \*\* 5%; \*\*\* 1%)

# Sensitivity analysis

- Results in the ordered probit are robust to the choice of the significance level used for drawing conclusions (1%, 5%, 10%)
- Regression models on Fisher's  $Z^r$  statistics give qualitatively similar results

# Main conclusions from probit model

- The impacts on employment and on labour force participation is more likely to be negative and statistically significant than on wages
- The labour market impact is less often statistically significant in geographically small labour market areas
- The impact on earlier immigrants is more often negative and statistically significant than on the native born;
- Cross-sectional studies are more likely to find a statistically significant negative impact than panel models
- Even within the same skill class, migrants may not compete directly with similarly skilled natives. They may be complements in production (confirmed by Ottaviano and Peri)

# Challenges for current research

- Is there a trade-off between wage and employment effects? Longhi et al. (2009): the lesser the impact on wages in a study, the greater the impact on employment in the same study
- How long does it take for labour markets to adjust?
- How much investment is triggered by immigration (or postponed by emigration)?
- Labour market impact has additional dimensions, many dynamic: hours, layoff, unemployment spells, industrial and occupational mobility, etc.
- The impact on other markets (e.g. housing market!) and relative prices should be considered
- Long-run impact depends on causal effect on education and innovation



Thank You!