D. G. ECONOMIC RESEARCH

Assimilation of Immigrants in Spain: A Longitudinal Analysis

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Question of the paper

- **Assimilation of immigrants is a broad concept: adoption of values and traditions, similar behaviour in terms of fertility, consumption…**

- **Does it exist earnings assimilation of non EU-15 immigrants in Spain? This is an important question given.**

  – Intensity of immigration shock over the last years

  – Its consequences in terms of productivity and well-being

  – And we know very little about it

Question of the paper

- Several studies have found a large wage gap between natives and immigrants.
  - –Significant impact on poor productivity performance

- Not much results on wage assimilation.
  - –Fernandez & Ortega (2006) use repeated cross sections of Labor Force Survey to study assimilation in labor conditions.
  - –Amuedo-Dorantes & de la Rica (2007) use the EES 02 & Census data to find that immigrants from no EU-15 earn 30% less than Spaniards. This gap decreases in 15pp the gap during the first five years.

- This is the first study that analyzes relative wage growth between natives and immigrants using a longitudinal dataset that allows to follow workers since their entry in the labour market

Question of the paper

- **Previous literature on earnings assimilation:**

  – As immigrants spend time in the host country, they adapt pre-existing skills and acquire new country specific skills that yield a payoff, decreasing the differences respect to the native population (Sjaastad (1962), Ben Porath (1967)).

  –The basic framework to study assimilation of earnings is based on Chiswick (1978):

$$\ln w_i = \beta X_i + \alpha I_i + \delta ysm_i I_i + \varepsilon_i$$

  –Research has found that in the US labor market the initial differential for Mexicans is at least 40% and one year more in the host country approximately closes the gap with natives 2%.

Key findings

- **Our estimates show a significant assimilation process over the time spent in Spain**

  – The first 5 years of experience in Spain reduce the wage gap (30%) by around 15 pp. and the following 5 years by 5 pp additionally.

- **Mechanisms underlying assimilation:**

  – Human capital accumulation appears to be the most important determinant in increasing wages (mostly occurring within the firm).

  – Mobility across regions plays a smaller role.

Outline

1. **Empirical Strategy**
2. **Data**
3. **Results**
4. **Mechanism underlying assimilation**

Empirical Strategy

- **Earnings of nationals:**

$$W^n{}_{it} = e^{(\mu_t + \varepsilon_{it})} W^n{}_0 \prod_{k=1}^{t} \left(1 + \delta^n{}_k\right)$$

$$\ln W^n{}_{it} = \ln W^n{}_0 + \sum_{k=1}^{t} \delta^n{}_k + \mu_t + \varepsilon_{it} = f^n(educ, birth\_cohort) + \sum_{k=1}^{t} \delta^n{}_k + \mu_t + \varepsilon_{it} \quad (1)$$

- **Earning of immigrants:**

$$W^I{}_{it} = e^{(\mu_t + \varepsilon_{it})} W^I{}_0 \prod_{k=1}^{t^a} \left(1 + \lambda^I{}_k\right) \prod_{s=t^a}^{t} \left(1 + \delta^I{}_s\right)$$

$$\ln W^I{}_{it} = \ln W^I{}_0 + \sum_{k=1}^{t^a} \lambda^I{}_k + \sum_{s=t^a}^{t} \delta^I{}_s + \mu_t + \varepsilon_{it} = f^I(educ, entry\_cohort) + \sum_{k=1}^{t^a} \lambda^I{}_k + \sum_{s=t^a}^{t} \delta^I{}_k + \mu_t + \varepsilon_{it} \quad (2)$$

Empirical Strategy

- **Pooling all together :**

$$\ln W_{it} = \ln W^{N}{}_{0} + \sum_{k=1}^{t} \delta^{N}{}_{k} + \left(\ln W^{I}{}_{0} - \ln W^{N}{}_{0}\right) I + \sum_{s=1}^{t^{a}} \left(\lambda^{I}{}_{s} - \delta^{N}{}_{s}\right) I_{i} + \sum_{k=t^{a}}^{t} \left(\delta^{I}{}_{k} - \delta^{N}{}_{k}\right) I_{i} + \mu_{t} + \varepsilon_{it} \quad (3)$$

- **There is assimilation if the initial wage differential decreases over the years of residence in Spain:**

$$\delta^{I}{}_{k} - \delta^{N}{}_{k} > 0 \qquad \forall k \in \{t^{a}, t\}$$

Empirical Strategy

- Using longitudinal data, we observe the whole labour market career in Spain, therefore we could estimate the actual wage growth of stayers in the host country.
  - *Figure*

- Assimilation is upward/downward estimated in single/repeated cross section if:
  - The quality of new immigrants decreases/increases.
  - Those who stay are better/worse.

Outline

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Data

- **We use MCVL-2005 which consists in a 4% random sample of all individuals who have been affiliated in Social Security records during 2005.**

- **This database contains whole labor market history of individuals with information on:**

  - Wages (top coded)
  - Personal characteristics (Nationality, sex, age, proxy for education)
  - Job characteristics (Sector, type of contract, firm's size, province)

- **Regarding immigrants, we should recall that**

  - We have information about legal immigrants working in the formal sector
  - Previous experience in the origin country is not observed. We proxy by potential experience

Data

- **Some cleaning of the data:**
  - We drop unemployment spells
  - We keep only General Regimen employment spells
  - We keep workers who begin their labour career after 1979
  - We keep 50% of natives and all migrants. Results for males 25-55

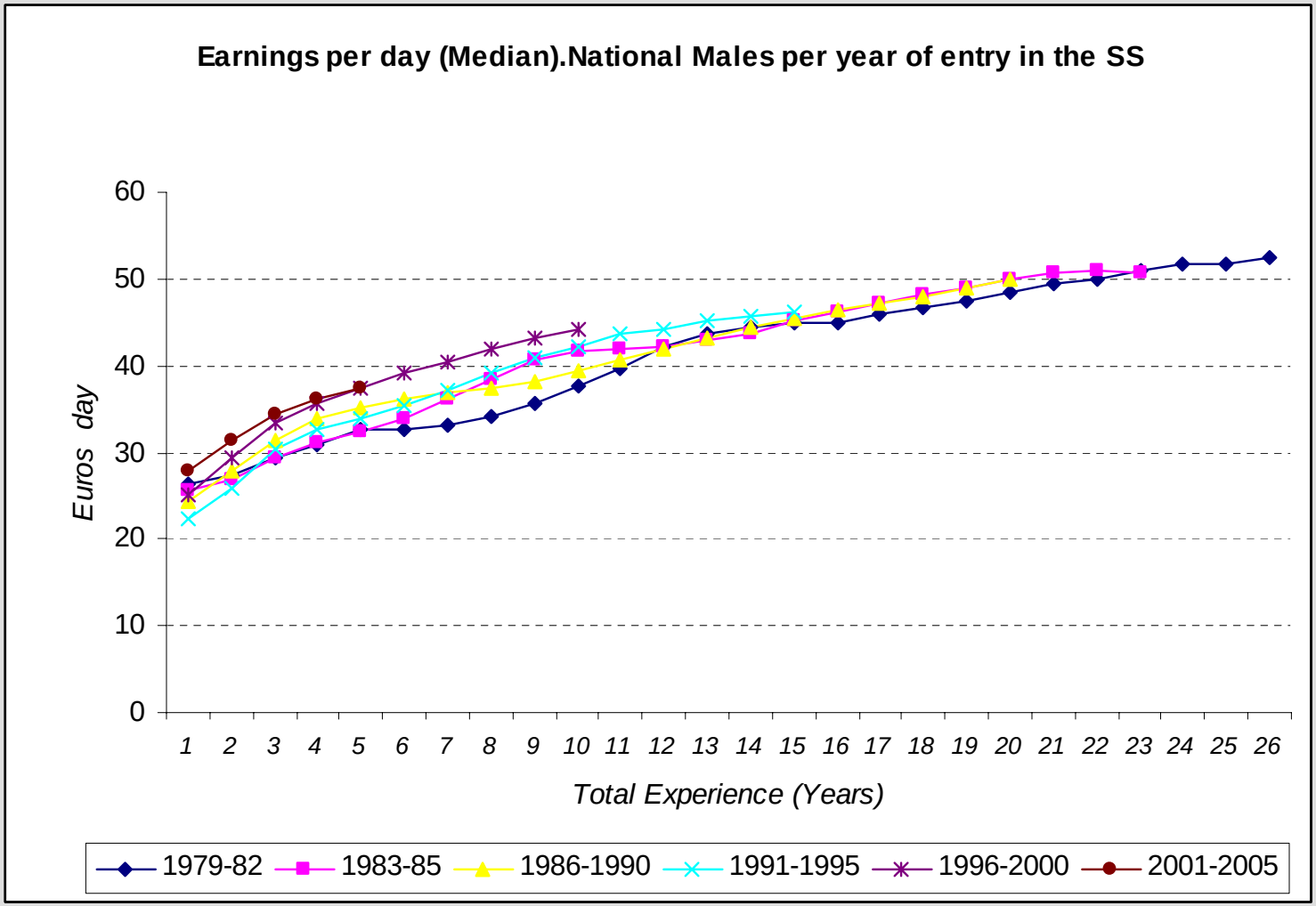
- **Description of variables:**
  - Daily earnings:
    - *The sum of all Social Security contributions **in one particular month** divided by the number of days worked during that month.*
    - *The sum of all Social Security contributions **in the year** divided by the number of days worked during that year.*
  -

Data

- **We cannot perform OLS regressions due to top coding; we do median regressions (Powell, 1984).**

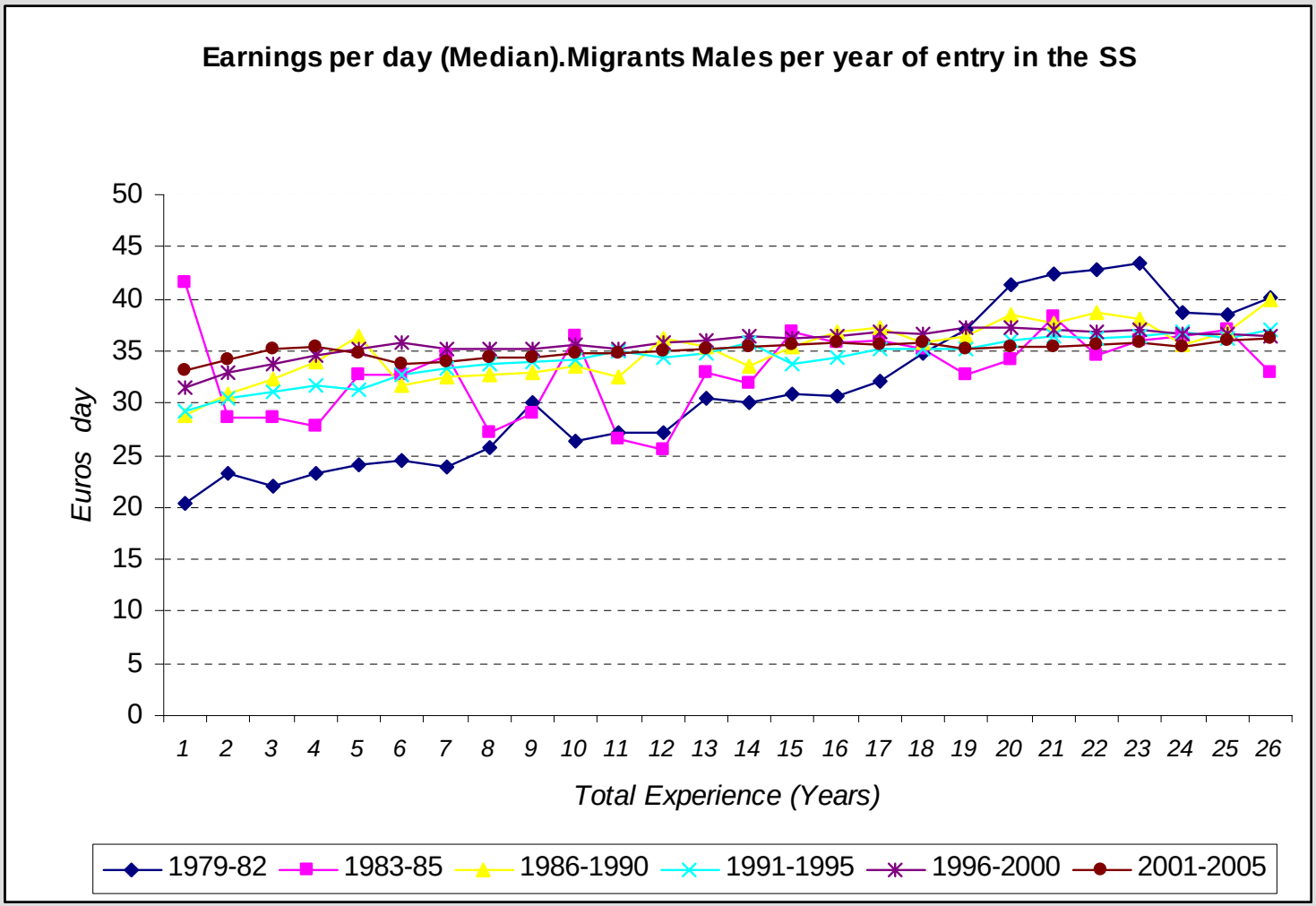
- **Unobserved experience can be a specially problematic in the case of migrants affected by a process of regularization:**
  - –These processes have been common in Spain and we know this migrants have already spent a time in Spain before they are observed in our sample
  - –As a robustness test, we drop observations of those individuals entering in the labour market in “regularization periods”
    - *•Regularizations: 1985-86(38.181); 1991(110.100); 1996(21.300); 2000(163.900); 2001(216.400); 2005(548.700).*

Data



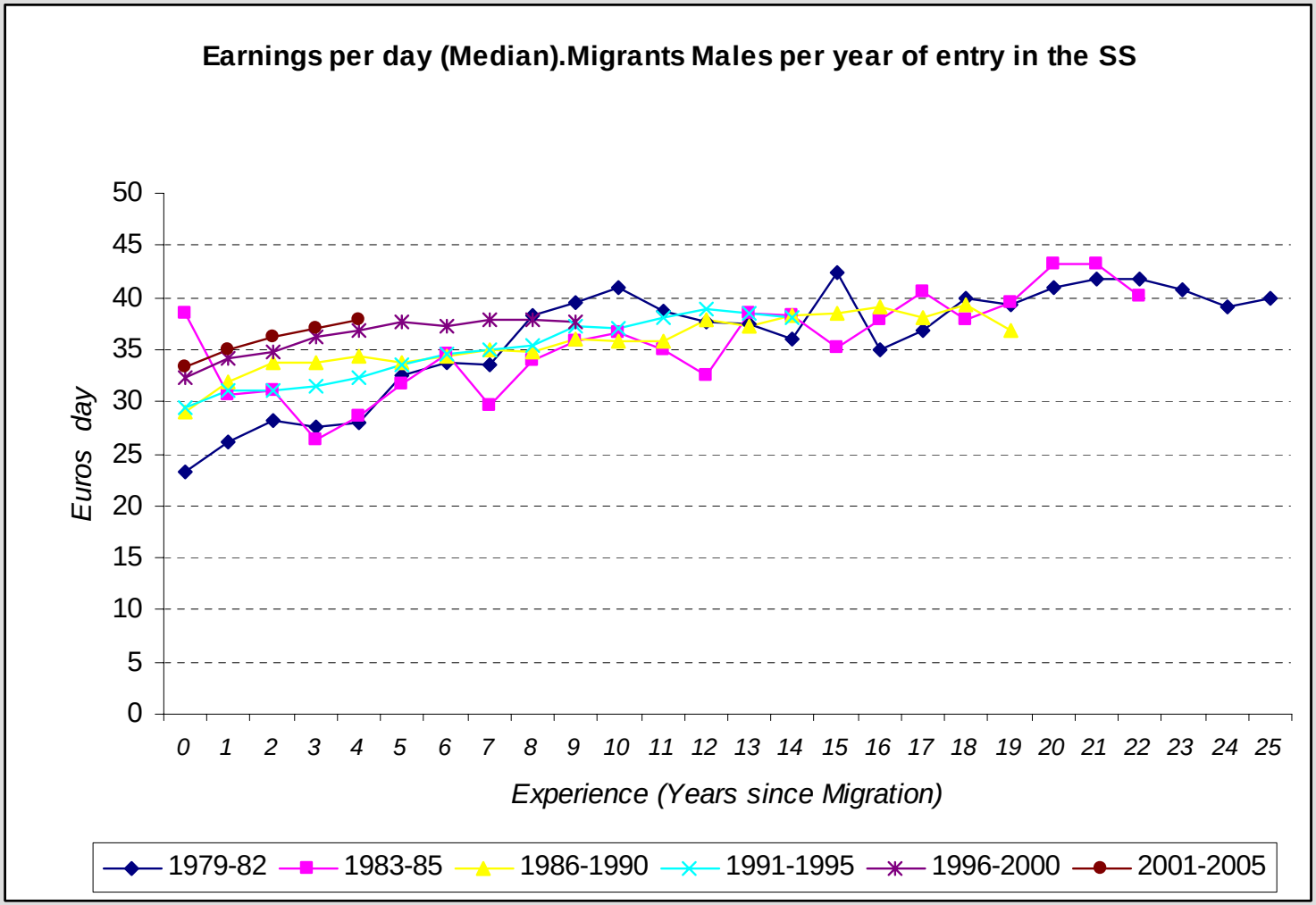
Higher initial wages for new cohorts on native males (improvement in educational attainment)

Data



A flatter wage profile for immigrants and less clear pattern in initial wages

Data



It is crucial to distinguish between experience in Spain and abroad

Outline

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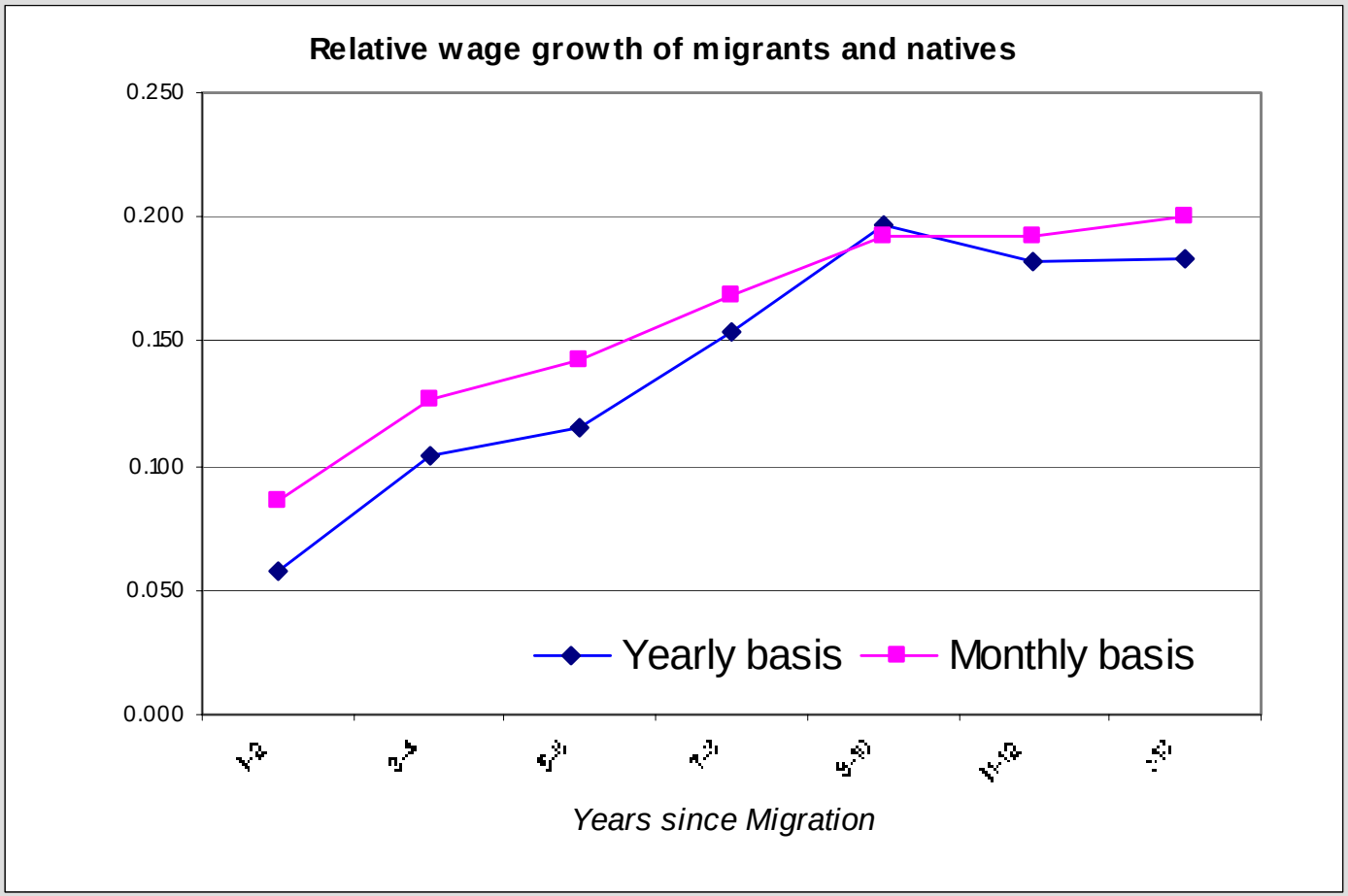
Results

- **We estimate a quantile regression for the median:**

$$\ln W_{it} = \alpha_0 + f(educ_i) + g(birth\_cohort)(1-I_i) + \alpha_1 I + g(entry\_cohort_i)I_i +$$
$$+ \sum_{k=1}^{t} \delta^N{}_k + \sum_{k=1}^{t^a} \left(\lambda^I{}_k - \delta^N{}_k\right) I_i + \sum_{s=t^a}^{t} \left(\delta^I{}_k - \delta^N{}_k\right) I_i + \alpha NAIRU_t + \varepsilon_{it}$$

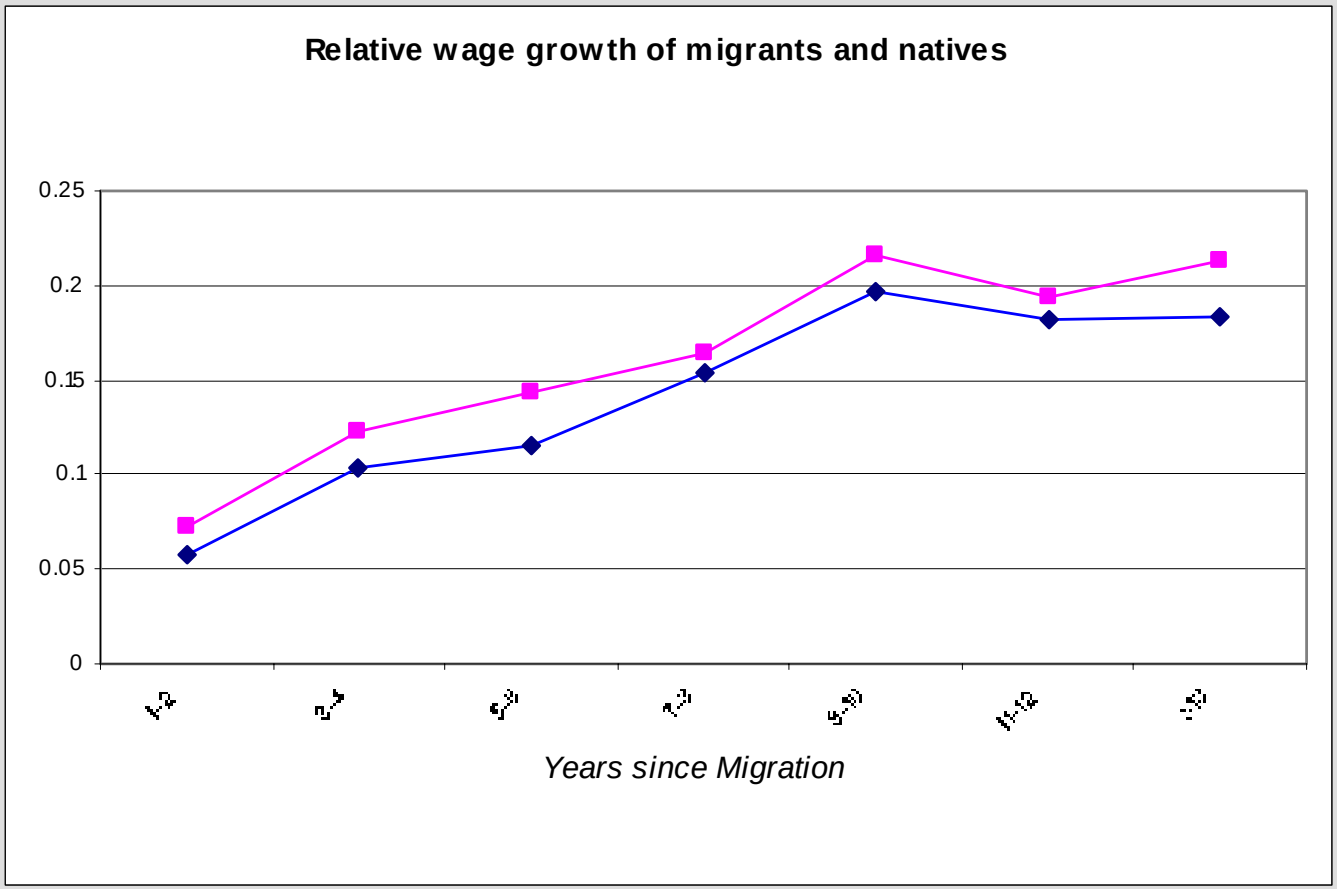
- **We focus on the coefficients on labour market experience in Spain**

Results



Immigrant's wages grow faster than native's ones, reducing initial gap by more than 10 pp. in the first 5 years and close to 20 pp. after 10 years in the Spanish labour market

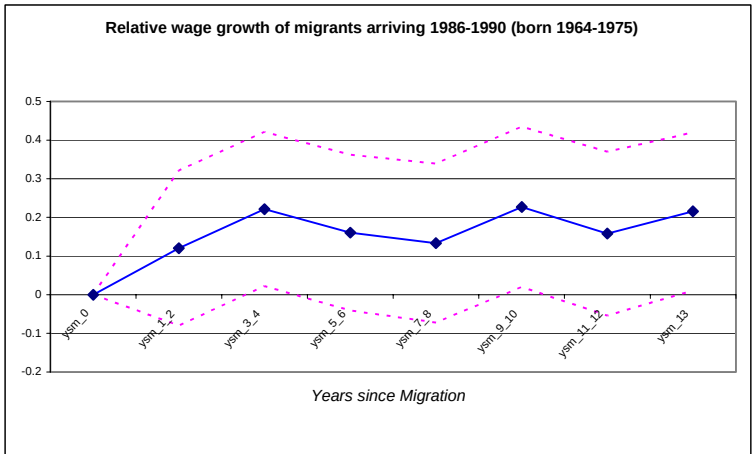
Results

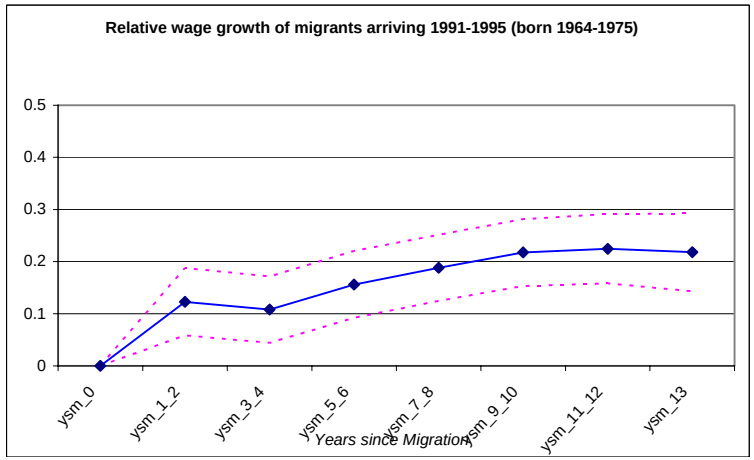


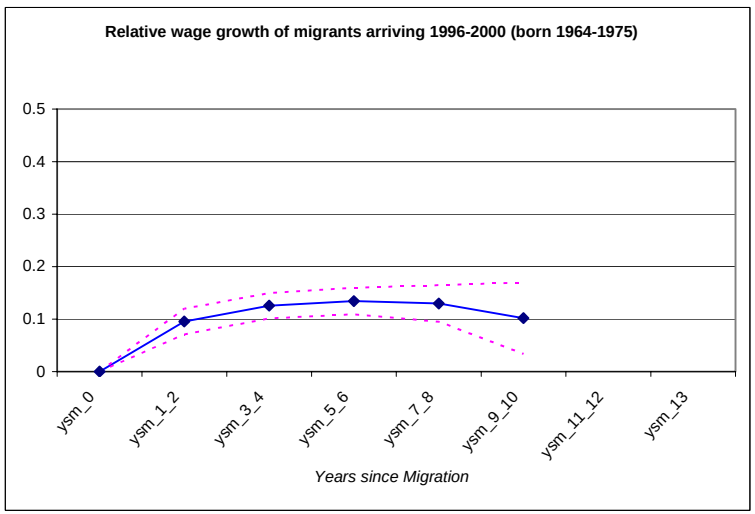
This result holds when we drop regularization periods

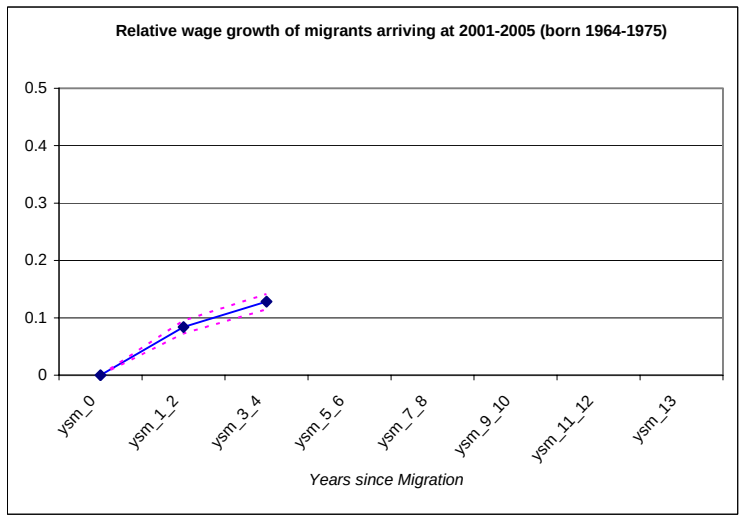
Results

Figure 6: Assimilation pattern by cohort of entry entry



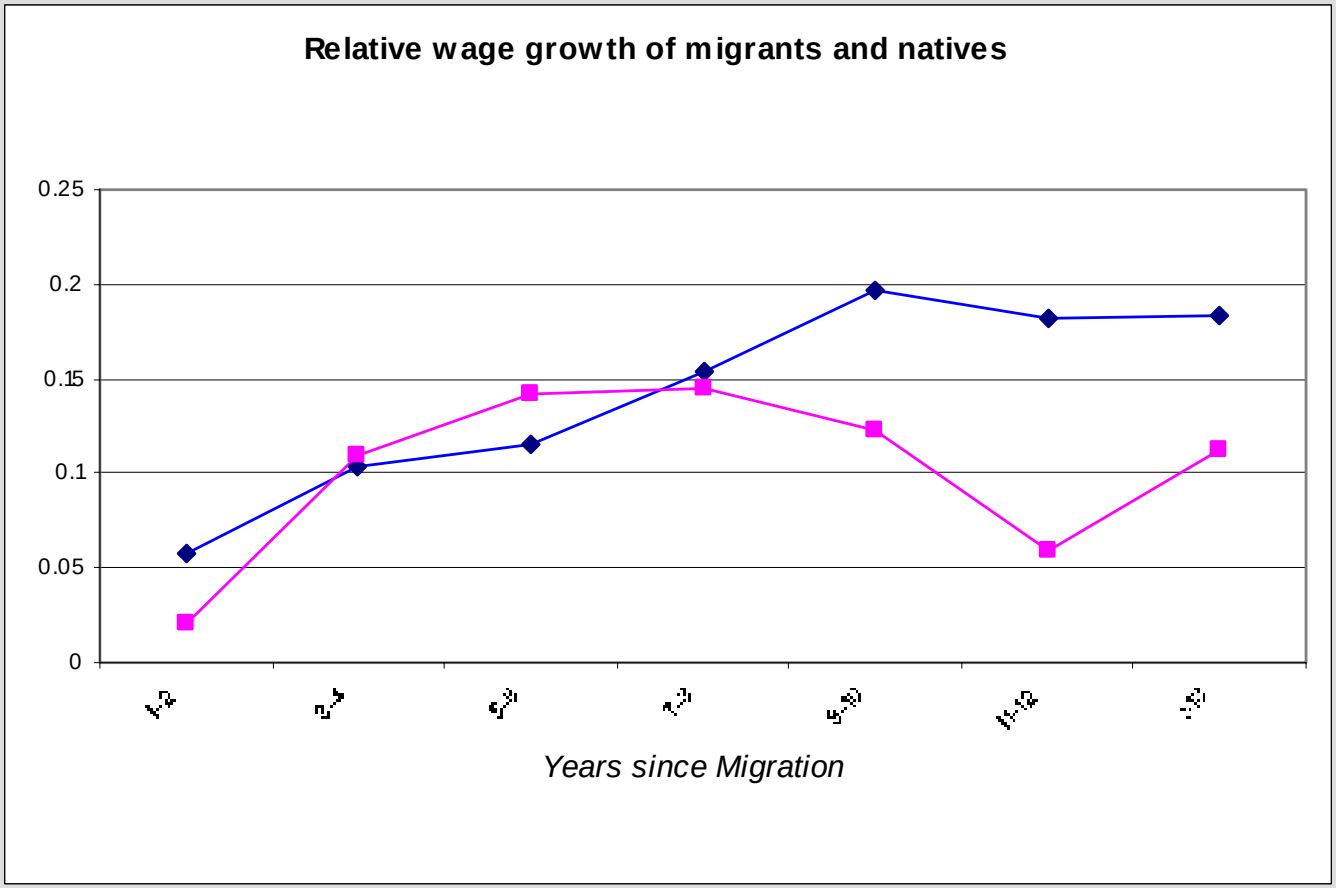






Earnings profile is quite similar across different entry cohorts although we are more confident about the results on more recent ones

Results



However, if we would have used a cross-section, estimated assimilation is downward biased (Table)

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Mechanisms underlying assimilation: strategy

Taking first differences on Log Wage equations:

$$\Delta W_{it+1} = \delta^{N}{}_{t+1} + \left(\delta^{I}{}_{t+1} - \delta^{N}{}_{t+1}\right) I_i + \quad v_{it+1} =$$

$$= \delta^{N}{}_{t+1} + \left(\delta^{I}{}_{t+1} - \delta^{N}{}_{t+1}\right) I_i +$$

$$+ \lambda_1 prov\_mov + \lambda_2 company\_mov + \lambda_3 \,\mathrm{sec}\, tor\_mov$$

Skill/Abilities within the firm

Regional mobility

Skill/Abilities outside firm

Mechanisms underlying assimilation

Table 6: Ols regressions of the yearly log wage change of non top coded individuals

Independent variables	(1)	(2)	(3)	(4)
noUE15	0.018	0.016	0.012	0.009
	(0,003)	(0,003)	(0,003)	(0,003)
Years since migration	-0.002	-0.002	-0.002	-0.002
	(0,000)	(0,000)	(0,000)	(0,000)
Total experience	-0.023	-0.023	-0.023	-0.022
	(0,000)	(0,000)	(0,000)	(0,000)
Total experience2	0.001	0.001	0.001	0.001
	(0,000)	(0,000)	(0,000)	(0,000)
Total experience3	0.000	0.000	0.000	0.000
	(5.49e-07)	(5.49e-07)	(5.49e-07)	(5.49e-07)
Change in province		0.036	0.039	0.042
		(0,002)	(0,002)	(0,002)
Change sector within province			0.058	0.061
			(0,001)	(0,001)
Change firm within sector and province				0.037
				(0,001)
Year dummies	Yes	Yes	Yes	Yes
Constant	0.129	0.129	0.125	0.123
	(0,006)	(0,006)	(0,006)	(0,006)

- **Around 10% is explained by higher regional mobility of migrants.**
- **Around 40% of the differential wage growth of immigrants is associated with higher mobility across sectors/firms**
- **Half of the higher wage growth can be associated with human capital accumulation within the firm**

Conclusions

- **The results do show an assimilation process over the time spent in Spain: the first 5 years of experience in Spain reduced the wage differential by around 15 pp. and the following 5 an additional 5pp.**

- **Mechanisms underlying assimilation:**
  - –Human capital accumulation appears to be the most important determinant in increasing wages (mostly occurring within the firm).
  - – Mobility across regions also plays a role although it is much smaller.

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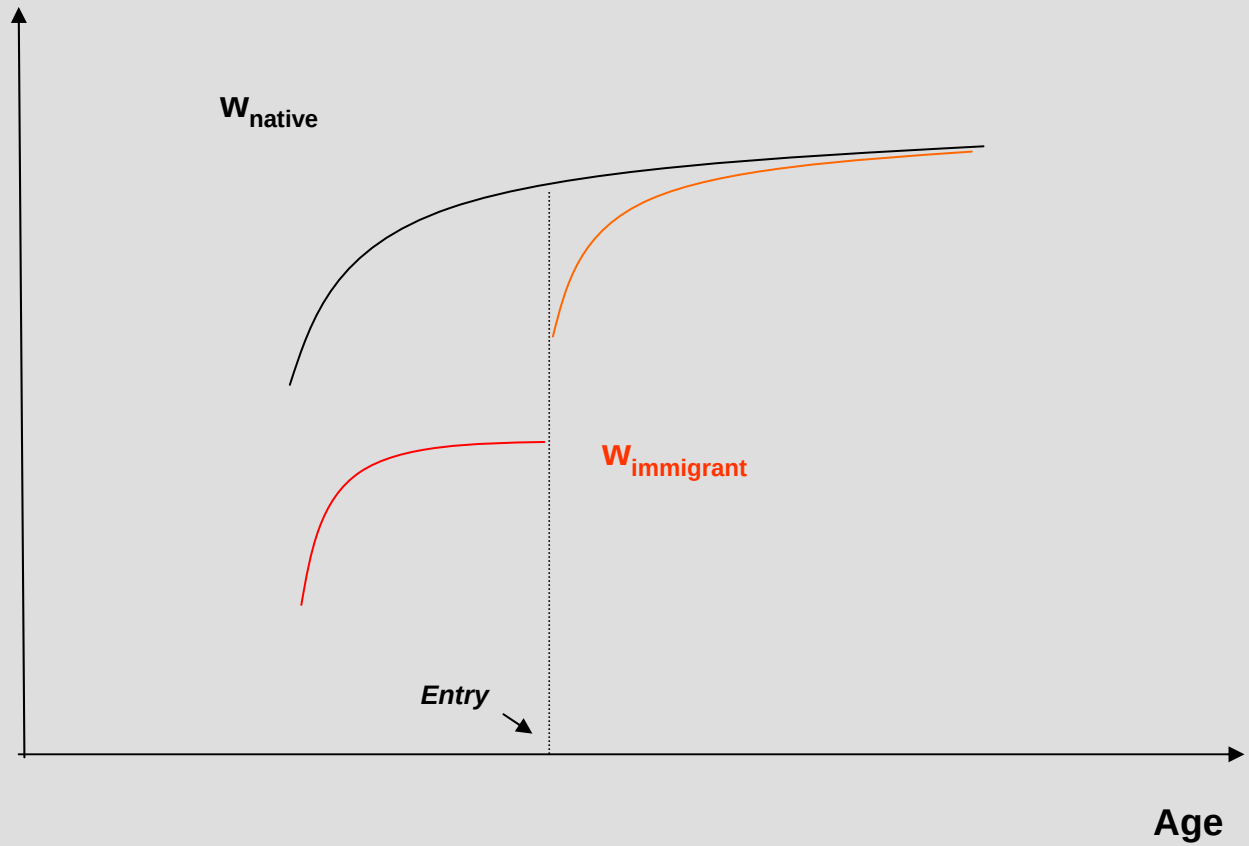
THANK YOU VERY MUCH!!!

BANCO DE ESPAÑA

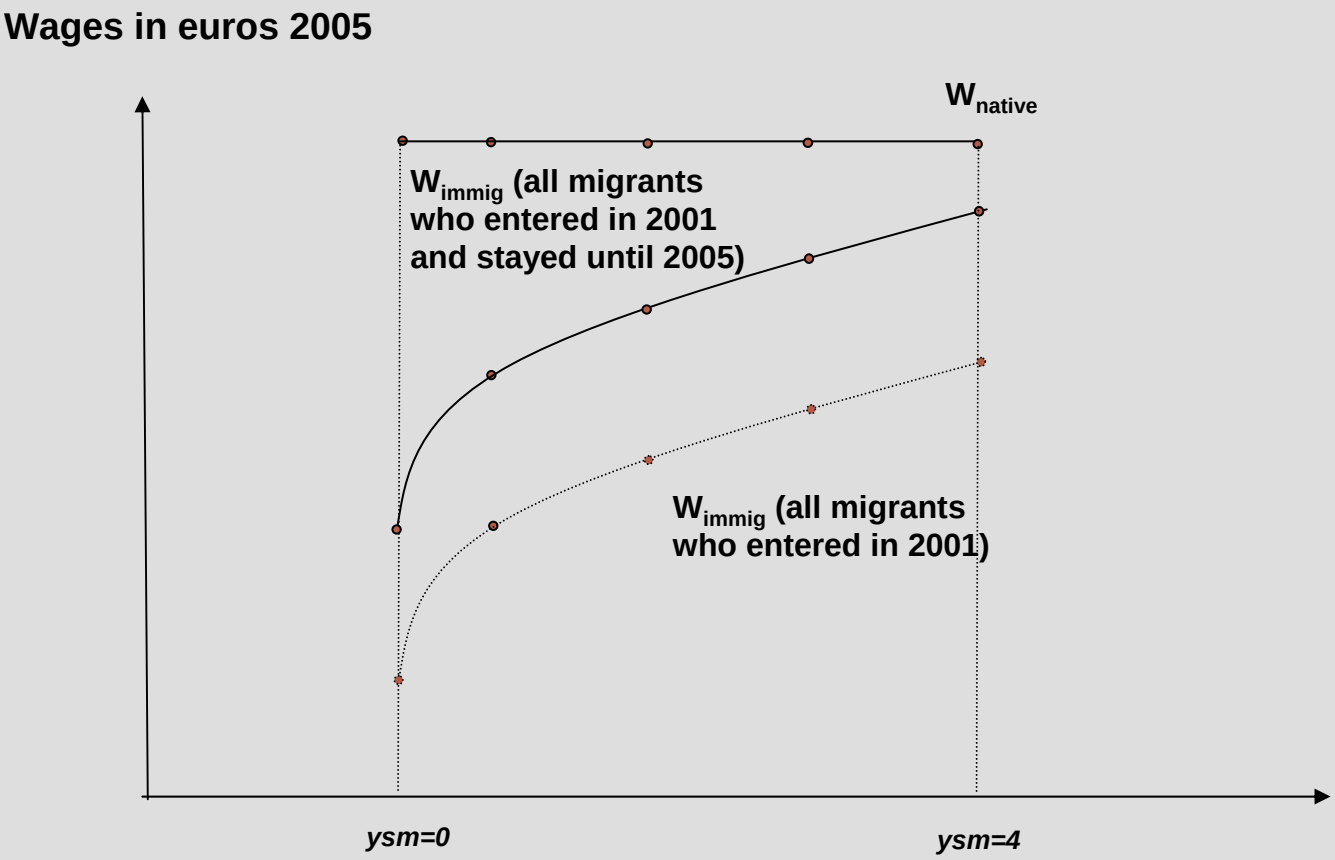
150 AÑOS DE HISTORIA
1856-2006

Empirical Strategy

Wages in euros 2007

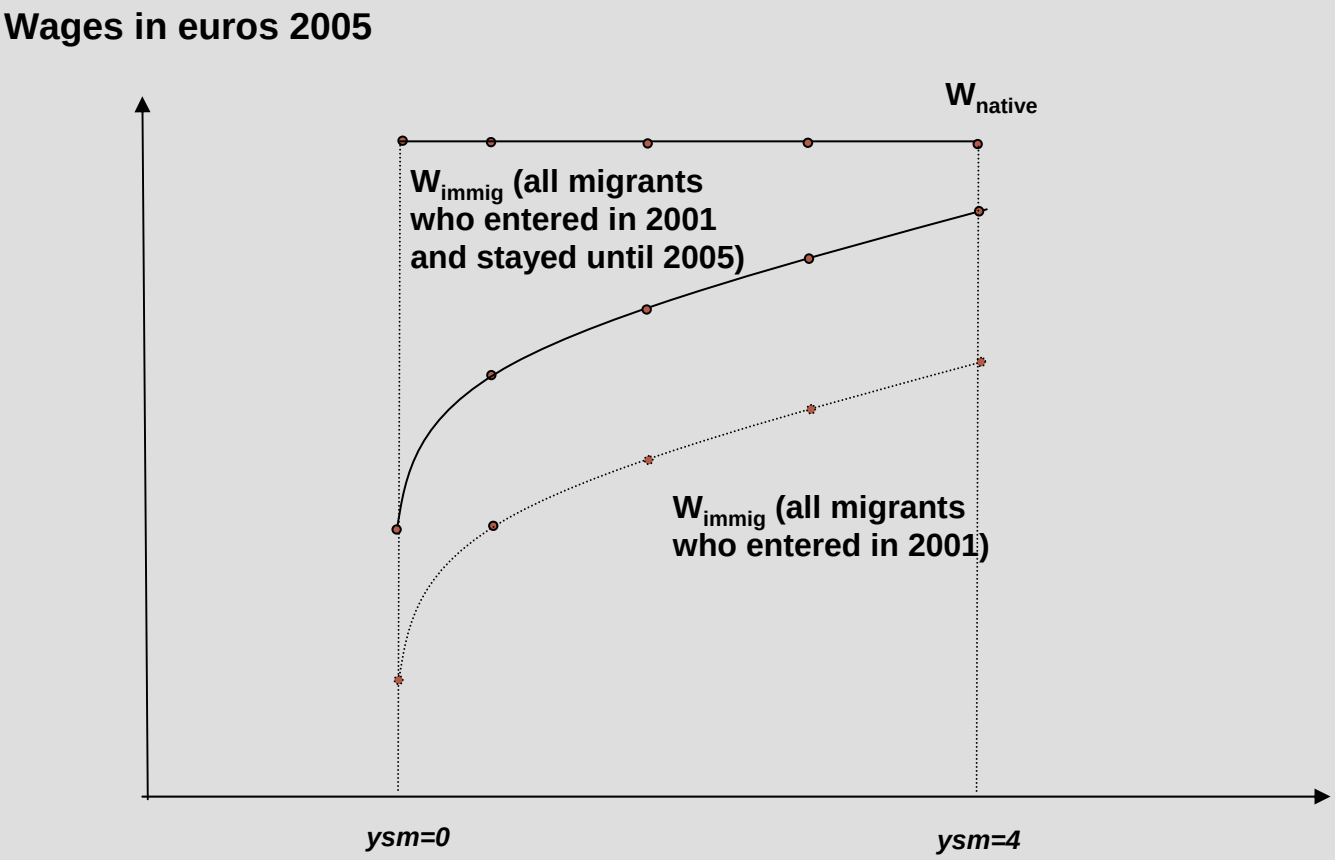


Empirical Strategy



Back

Empirical Strategy



Back

Change in immigrant cohort of entry and selective emigration

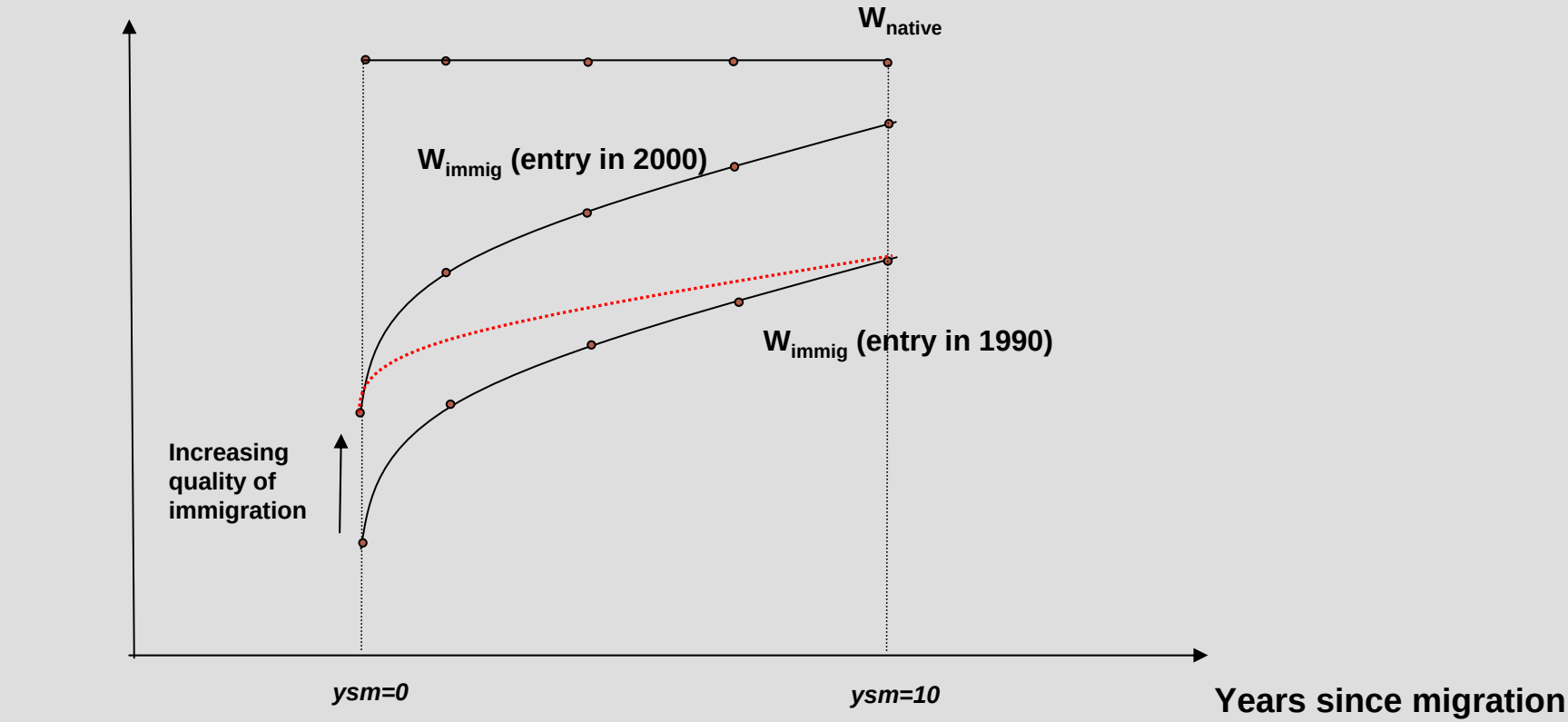
- **Increasing importance of migrants from enlargement (Back)**

	Enlargement	Africa	Latinamerican	Other
1988	8,53%	22,20%	54,49%	14,78%
1989	5,78%	26,90%	53,91%	13,41%
1990	5,71%	21,97%	58,90%	13,42%
1991	5,69%	38,29%	46,30%	9,72%
1992	4,30%	43,48%	40,73%	11,49%
1993	5,44%	39,17%	42,51%	12,87%
1994	6,52%	37,13%	42,59%	13,76%
1995	5,61%	36,37%	45,26%	12,76%
1996	6,57%	40,89%	41,11%	11,42%
1997	7,69%	39,43%	43,62%	9,25%
1998	8,82%	38,28%	45,29%	7,61%
1999	10,64%	30,99%	52,74%	5,62%
2000	13,83%	19,23%	63,29%	3,65%
2001	16,87%	16,71%	63,05%	3,37%
2002	23,39%	15,06%	58,35%	3,19%
2003	25,42%	16,96%	53,50%	4,12%
2004	29,61%	21,29%	41,12%	7,98%
2005	28,11%	21,96%	41,84%	8,08%

Survey of Residential Variation

Empirical Strategy

– 1) An increase in the quality of migrants produces a downward bias in assimilation since in a single cross section when I vary ysm I vary the cohort of entry. (Back)



Results

Table II a. Wage equation estimations at percentile 50. Dependent variable: logarithm of daily wages*
*Wages measured as the monthly contribution registered over total days worked in a given month

	1	*2*	*3*
Independent variables	Coefficients	Coefficients	Coefficients
	Std. Err	Std. Err	Std. Err
noUE15	**-0.305**	**-0.395**	**-0.349**
	0.022	0.019	0.000
Years since migration 0-2	**0.047**	**0.086**	**0.103**
	0.010	0.005	0.000
Years since migration 3-4	**0.121**	**0.127**	**0.142**
	0.008	0.006	0.000
Years since migration 5-6	**0.167**	**0.143**	**0.161**
	0.011	0.009	0.000
Years since migration 7-8	**0.179**	**0.169**	**0.178**
	0.021	0.012	0.000
Years since migration 9-10	**0.145**	**0.192**	**0.206**
	0.027	0.015	0.000
Years since migration 10-12	**0.091**	**0.193**	**0.207**
	0.051	0.018	0.000
More than 13 Years since migration	**0.148**	**0.201**	**0.204**
	0.024	0.022	0.000
Experience Abroad (From 5 to 9 years)	**0.077**	**0.093**	**0.057**
	0.022	0.013	0.000
Experience Abroad (From 10 to 14 years)	**0.075**	**0.063**	**0.025**
	0.022	0.013	0.000
Experience Abroad (From 15 to 19 years)	**0.048**	**0.009**	**-0.020**
	0.022	0.014	0.000
More than 25 years of Experience Abroad	**0.040**	**0.004**	**-0.023**
	0.024	0.015	0.000
Arrival 1983-1985		**-0.100**	**-0.139**
		0.040	0.000
Arrival 1986-1990		**-0.012**	**-0.041**
		0.022	0.000
Arrival 1991-1995		**-0.002**	**-0.048**
		0.013	0.000
Arrival 1996-2000		**0.080**	**0.046**
		0.013	0.000
Arrival 2001-2005		**0.058**	**0.019**
		0.013	0.000
constant	**8.526**	**8.763**	**8.760**
	0.009	0.004	0.000
R^2	0.14	0.14	0.14

1. Cross- Section 2005
2.Longitudinal Regresion 1980-2005
3. Without including those migrants whose arrival was during a period of Special Immigrant Legalization

Mechanism underlying assimilation: data

- **Organization of the data set:**

•At each point in time we observe the characteristics of the worker: type of contract, days worked in the month of the reference week, sector of activity, company, province of working place, etc.

Individual	Year	Reference Week	Labor Status	SECTOR	Company	Province	Pmov company	Pmov contract inside the company	Pmov province	Pmov sector	Wage
A	1990	2	Temporary	X	A	O	.	.	.	.	w1
A	1991	2	Temporary	X	A	2	0	0	0	0	w2
A	1992	2	.	.	.	.	.	.	.	.	w3
A	1993	2	Permanent	Z	M	2	.	.	0	.	.
A	1994	2	Permanent	N	T	3	1	.	1	1	w5
A	1995	2	Temporary	N	R	3	1	.	0	0	w6
...	...	...	...	...	...	...	...	...	...	...	...

• We compute the daily wage as the sum of total contributed earnings over total days worked in the month of the reference week.

•All the previous information joined with personal characteristics gives us a very good characterization of the labor history for each individual in the sample.

Individual	Year	no UE15	1st year working	birth date	Reference Week	Labor Status	SECTOR	Company	Province	Wage
A	1990	0	1980	1975	2	Temporary	X	A	O	w1
A	1991	0	1980	1975	2	Temporary	X	A	2	w2
A	1992	0	1980	1975	2	.	.	.	.	.
A	1993	0	1980	1975	2	Permanent	Z	M	2	w4
A	1994	0	1980	1975	2	Permanent	N	T	3	w5
A	1995	0	1980	1975	2	Temporary	N	R	3	w6
...	...	...	...	...	...	...	...	...	...	...

Mechanism underlying assimilation

- **To estimate a probability model to understand the mechanism underlying assimilation**

$$Z = (z^1, ..., z^j) = (\text{province workplace, sector of activity, company, occupancy within the company, type of contract...})$$

$$I(z^j) = \begin{cases} 1 \text{ if } z^j_t \neq z^j_{t+1} \\ 0 \text{ if } z^j_t = z^j_{t+1} \end{cases}$$

$$P(I(z^j) = 1) = g(\text{nationality, gender, education, ...})$$

Mechanism underlying assimilation

Dependent Variable: **Province movement**	(A) Coefficients Std. Err	(B) Coefficients Std. Err	(C) Coefficients Std. Err	(D) Coefficients Std. Err
noUE15	**0,0163**	**0,0155**	**0,0082**	**0,0047**
	0,0004	0,0004	0,0005	0,0005
Years since migration_3_4			**0,0257**	**0,0253**
			0,0010	0,0010
Years since migration_5_6			**0,0114**	**0,0108**
			0,0014	0,0014
Years since migration_7_8			**0,0004**	**-0,0006**
			0,0020	0,0020
Years since migration_9_10			**0,0009**	**-0,0005**
			0,0023	0,0023
Years since migration_11_12			**0,0024**	**0,0005**
			0,0026	0,0026
Years since migration_13			**-0,0059**	**-0,0085**
			0,0027	0,0027
edad		**0,0003**	**0,0003**	**-0,0002**
		0,0000	0,0000	0,0000
Illiterate		**0,0026**	**0,0025**	**0,0005**
		0,0003	0,0003	0,0003
Primary education		**0,0028**	**0,0028**	**0,0005**
		0,0003	0,0003	0,0003
Secondary education		**0,0017**	**0,0017**	**0,0006**
		0,0003	0,0003	0,0003
Total experience				**0,0007**
				0,0000
constant	**0,0112**	**0,0009**	**0,0009**	**0,0099**
	0,0001	0,0004	0,0004	0,0005

Mechanism underlying assimilation

Dependent Variable: **Sector Change**	(A) Coefficients Std. Err	(B) Coefficients Std. Err	(C) Coefficients Std. Err	(D) Coefficients Std. Err
noUE15	**0,0070**	**0,0122**	**-0,0056**	**-0,0131**
	0,0008	0,0009	0,0012	0,0012
Years since migration_3_4			**0,0553**	**0,0544**
			0,0022	0,0022
Years since migration_5_6			**0,0292**	**0,0281**
			0,0032	0,0032
Years since migration_7_8			**0,0186**	**0,0165**
			0,0044	0,0044
Years since migration_9_10			**0,0226**	**0,0196**
			0,0052	0,0052
Years since migration_11_12			**0,0070**	**0,0031**
			0,0059	0,0059
Years since migration_13			**0,0039**	**-0,0017**
			0,0061	0,0061
edad		**-0,0005**	**-0,0006**	**-0,0015**
		0,0000	0,0000	0,0000
Illiterate		**-0,0019**	**-0,0021**	**-0,0064**
		0,0007	0,0007	0,0007
Primary education		**0,0019**	**0,0018**	**-0,0031**
		0,0006	0,0006	0,0007
Secondary education		**-0,0028**	**-0,0028**	**-0,0051**
		0,0007	0,0007	0,0007
Total experience				0,0014
				0,0000
constant	**0,0630**	**0,0793**	**0,0796**	**0,0987**
	0,0001	0,0009	0,0009	0,0010

Mechanism underlying assimilation

Dependent Variable: Temporal to perment contract	(A) Coefficients Std. Err	(B) Coefficients Std. Err	(C) Coefficients Std. Err	(D) Coefficients Std. Err
Outside the firm				
noUE15	**0,0378**	**0,0496**	**0,0709**	**0,0497**
	0,0020	0,0023	0,0037	0,0048
Years since migration_3_4			**-0,0312**	**-0,0219**
			0,0052	0,0067
Years since migration_5_6			**-0,0319**	**-0,0283**
			0,0073	0,0089
Years since migration_7_8			**-0,0328**	**0,0007**
			0,0100	0,0115
Years since migration_9_10			**-0,0425**	**-0,0314**
			0,0121	0,0147
Years since migration_11_12			**-0,0666**	**-0,0782**
			0,0143	0,0158
Years since migration_13			**-0,0465**	**-0,0619**
			0,0150	0,0166
edad		**-0,0005**	**-0,0005**	**-0,0023**
		0,0000	0,0000	0,0001
Illiterate		**-0,0178**	**-0,0177**	**0,0112**
		0,0015	0,0015	0,0015
Primary education		**-0,0014**	**-0,0014**	**0,0194**
		0,0014	0,0014	0,0014
Secondary education		**0,0050**	**0,0050**	**0,0140**
		0,0014	0,0014	0,0014
Total experience				0,0029
				0,0001
constant	**0,1143**	**0,1316**	**0,1312**	**0,0990**
	0,0003	0,0020	0,0021	0,0022

Dependent Variable: Temporal to perment contract	(A) Coefficients Std. Err	(B) Coefficients Std. Err	(C) Coefficients Std. Err	(D) Coefficients Std. Err
Inside the firm				
noUE15	**0,0477**	**0,0527**	**0,0679**	**0,0497**
	0,0024	0,0028	0,0048	0,0037
Years since migration_3_4			**-0,0206**	**-0,0328**
			0,0067	0,0052
Years since migration_5_6			**-0,0269**	**-0,0337**
			0,0089	0,0073
Years since migration_7_8			**0,0053**	**-0,0381**
			0,0115	0,0100
Years since migration_9_10			**-0,0236**	**-0,0512**
			0,0147	0,0121
Years since migration_11_12			**-0,0676**	**-0,0782**
			0,0158	0,0143
Years since migration_13			**-0,0476**	**-0,0626**
			0,0166	0,0150
edad		**-0,0007**	**-0,0007**	**-0,0026**
		0,0000	0,0000	0,0001
Illiterate		**0,0183**	**0,0184**	**-0,0285**
		0,0015	0,0015	0,0016
Primary education		**0,0276**	**0,0276**	**-0,0132**
		0,0014	0,0014	0,0015
Secondary education		**0,0175**	**0,0175**	**0,0000**
		0,0014	0,0014	0,0015
Total experience				0,0036
				0,0001
constant	**0,0712**	**0,0722**	**0,0720**	**0,1701**
	0,0003	0,0020	0,0020	0,0023