



Monopsony, Efficiency, and the Regularization of Undocumented Immigrants

George J. Borjas and Anthony Edo
Harvard University and CEPII

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1. Undocumented immigration

- Large numbers of undocumented immigrants in many industrialized countries.
- Over 10.5 million in the United States (prior to the recent surge): 23 percent of the foreign-born population and about 3 percent of the total population.
- Between 4 and 5 million live in Europe: almost 20 percent of the foreign-born population and 1 percent of the total population.
- Undocumented population triggers economic shocks central to the debate over immigration policy AND the inevitable question of what to do about the current stock of undocumented immigrants.



2. Amnesty

- A frequent solution is to declare an amnesty that regularizes the status of the currently undocumented.
- In the United States, the 1986 Immigration Reform and Control Act (IRCA) regularized 2.7 million undocumented persons and increased penalties for firms that hired undocumented workers.
- A 2002 amnesty in Italy conditioned eligibility on being continuously employed during the three months prior to application and having a minimum one-year employment contract after regularization.
- A 2005 amnesty in Spain required a job contract with an employer for at least six months to be eligible.



3. The French context

- On July 23, 1981, the newly elected socialist government of President François Mitterrand regularized the status of undocumented workers.
- The Mitterrand campaign platform contained 110 policy measures that were to be implemented after the election. **NONE** of them mentioned a potential regularization of undocumented immigrants, making it impossible to anticipate the “Exceptional Regularization”.
- Eligibility required entering France before January 1, 1981, and having a work contract valid for at least a year. The program regularized 131,360 immigrants.
- The regularized workers were predominantly male, low-skill, and lived disproportionately in the Île-de-France (Paris) region.
- They comprised 12 percent of the immigrant workforce, 2 percent of all workers in Paris, and nearly 1 percent of all workers in France.



4. Prior literature

- “Illegality allows employers to exert monopsonistic power over these workers because of their great fear of being reported to immigration authorities, which would lead to immediate deportation” (Rivera-Batiz, 1999, p. 96).
- Positive wage impacts of IRCA on the newly legalized (Kossoudji and Cobb-Clark, 2002; Amuedo-Dorantes and Bansak, 2011; and Pan, 2012).
- Regularization may affect earnings of other workers:
 - IRCA had a small positive impact on the wage of manufacturing workers (Cobb-Clark and Kossoudji, 1995).
 - Di Porto, Martino, and Naticchioni (2018) and Carrozo (2022) find that the 2002 Italian regularization program did not affect the wage of authorized workers.
 - Elias, Monras, and Vázquez-Grenno (2022) show that the 2005 regularization in Spain did not affect the employment of natives, but increased their wage.
- Chassambouli and Peri (2015) and Amior and Manning (2021) use search and monopsonistic models to simulate the impact of regularization policies, and conclude that such policies can be economically beneficial for natives.

5. Wage distribution of regularized immigrants in Paris before and after regularization

	Before regularization	After regularization
	(1)	(2)
Less than 3,000 francs	44.2	14.7
3,000 - 3,999 francs	32.4	45.3
4,000 - 4,999 francs	11.4	25.1
More than 5,000 francs	1.7	12.2
No answer	10.3	1.8

Source: Marie (1984, p.25).

Based on a representative sample of 3,200 regularized immigrants in the Paris region surveyed in December 1983. These data are no longer available.



6. Our paper

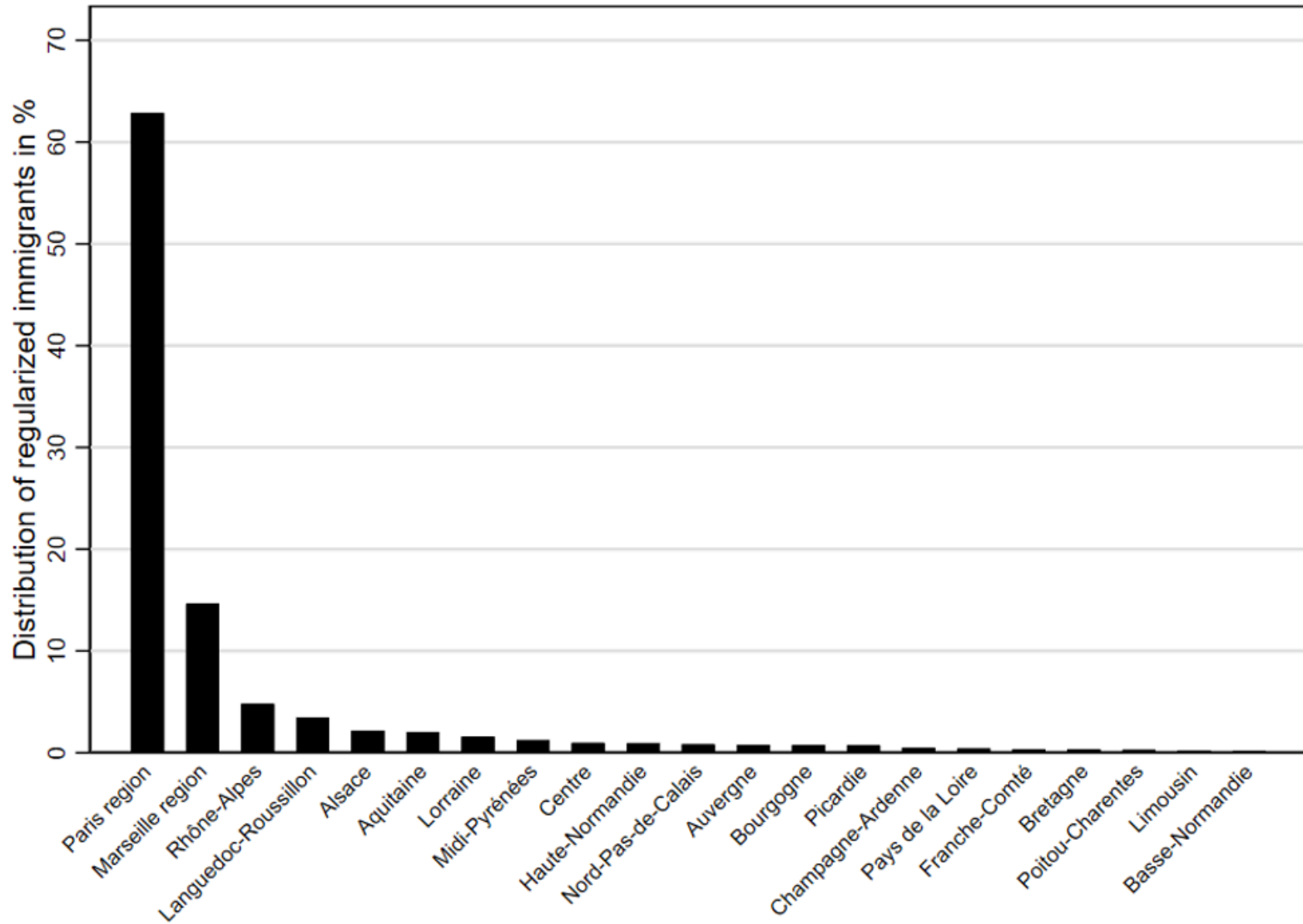
- Derives a theoretical framework where profit-maximizing monopsonistic firms combine the inputs of high-skill workers, low-skill authorized workers (both natives and legal immigrants), and low-skill undocumented immigrants.
- We use this model to examine the impact of an amnesty program on the wage and employment of all groups.
- A regularization program that reduces monopsony power in the undocumented labor market has two important consequences
 - First, it moderates the inefficiency, leading to an increase in the employment of undocumented workers.
 - Second, the expansion may spill over to the labor market for authorized workers, increasing their employment and wages as well.
- By reducing monopsony power in the undocumented labor market, a regularization program improves labor market efficiency and can generate a substantial increase in output, a “regularization surplus.”



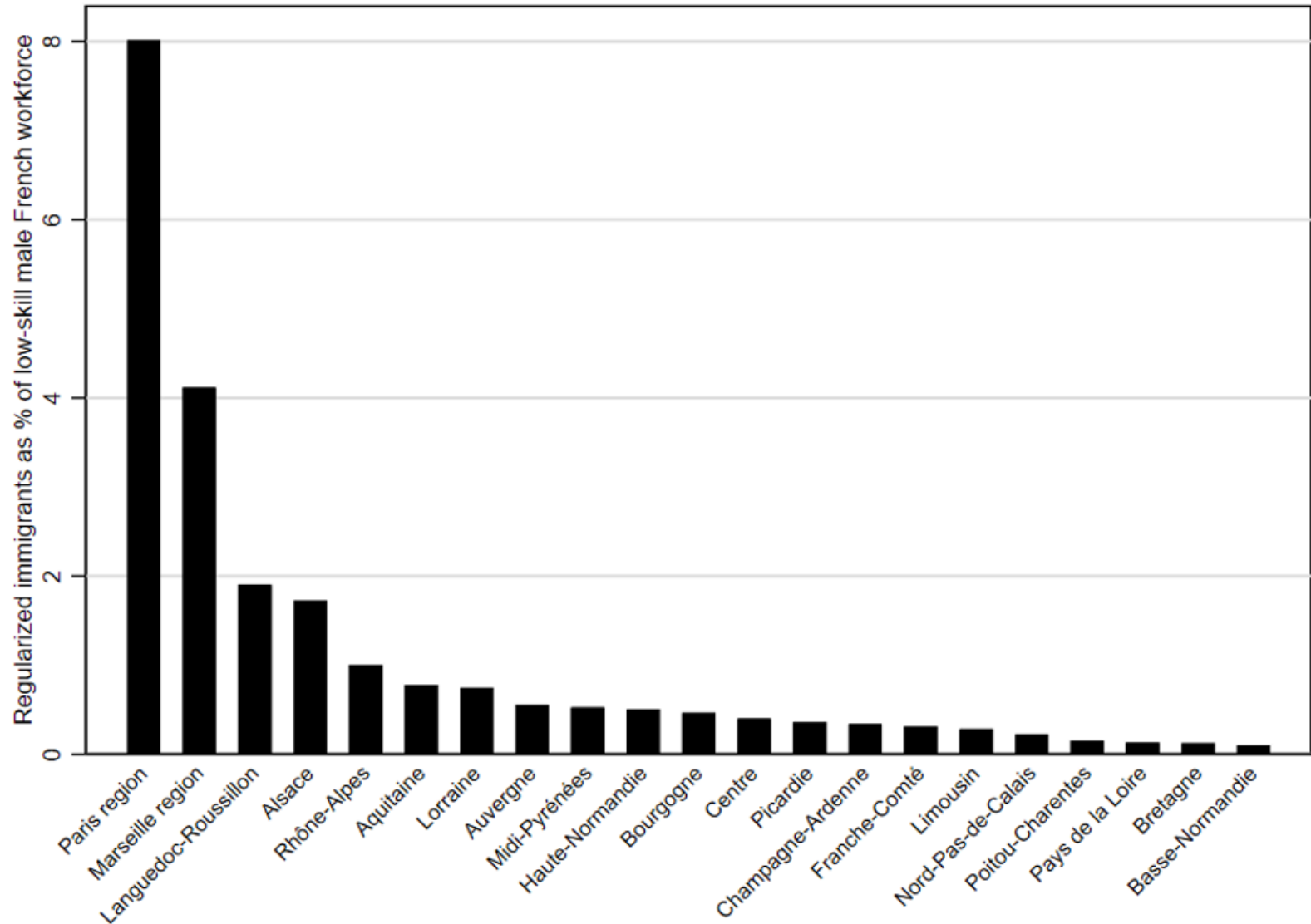
7. Summary of empirical results

- We exploit the geographic concentration of the regularized workforce in Paris to identify the impact on the employment and wages of natives, legal immigrants, and undocumented persons.
- We generally find positive effects for many groups, but particularly so for the male, low-skill workforce that included most of the regularized immigrants.
- We also estimate the aggregate impact of the regularization using data on regional per-capita GDP in France. Regularization increased GDP in Paris by about 1 to 2 percent, implying an increase in French GDP of about 0.5 percent.
- This empirical estimate of the surplus coincides with the simulation estimate produced by a textbook supply-and-demand framework, where we interpret the area under the demand curve as total product and calculate the GDP implied by the expansion in employment induced by the regularization program.

8. Distribution of regularized immigrants across regions



9. Number of regularized immigrants *relative* to low-educated male French workers across regions





10. Production technology

$$Q = f(L_H, L_A, L_U)$$

- L_H represents the high-skill workforce; L_A represents the low-skill authorized workforce; and L_U represents the low-skill undocumented workforce.
- Assume that the production function is linear homogenous.
- Barten, Kloeck, and Lempers (1969) show that if there is a unique solution to the canonical output-constrained profit-maximization problem, linear homogeneity implies that the Hessian has rank $N - 1$, where N is the number of inputs. Further, all inputs have diminishing marginal product ($f_{ii} < 0$), and all second-order principal minors are positive ($f_{ii}f_{jj} - f_{ij}^2 > 0$).



11. Monopsony

- Undocumented immigrants have restricted job opportunities. Participation in the open labor market may lead to exposure and deportation.
- There is heterogeneity within the undocumented population in the cost of such detection. For some undocumented immigrants, the chance of getting caught and the cost of exposure may be relatively low. For others, the cost may be very high (e.g., detection affects opportunities of family members).
- An undocumented worker may not quit his current job even if the employer were to cut the wage slightly, as entering the open labor market risks exposure or being reported to the authorities.
- The fact that firms have a somewhat captive audience in the undocumented workforce and face an upward-sloping supply curve if they wish to hire more undocumented immigrants is a key source of monopsony power in the undocumented labor market.



12. Supply functions

$$L_i = P_i w_i^{\frac{1}{\epsilon_i}}, \quad i = (H, A, U)$$

where ϵ_i ($\epsilon_i \geq 0$) is the reciprocal of the supply elasticity giving the number of type- i workers willing to work at the firm at a given wage, and measures the firm's monopsony power; P_i gives the “baseline” number of workers when the wage equals zero and supply is perfectly inelastic ($\epsilon_i = \infty$), and w_i is the wage.

Rewrite the supply function in terms of the inverse supply curve:

$$w_i = P_i^{-\epsilon_i} L_i^{\epsilon_i}$$

We allow for the possibility that employers have market power over all labor inputs, but the firm will typically have greater monopsony power over undocumented workers (i.e., $\epsilon_U > \epsilon_H$ and $\epsilon_U > \epsilon_A$)



13. First-order conditions

$$f_i = (1 + \epsilon_i)w_i = (1 + \epsilon_i)P_i^{-\epsilon_i}L_i^{\epsilon_i}$$

- The first-order conditions equate the value of marginal product to the marginal cost of a given type of worker.
- The greater the monopsony power—i.e., the greater the elasticity ϵ_i —the larger the gap between a worker's marginal product and his wage.

14. Regularization and marginal cost

- A regularization program may affect several parameters in the model, including the extent of monopsony power in the undocumented sector, and impose new costs on the hiring of the newly legalized workers (such as taxes that were previously unpaid).
- Consider a policy that only reduces monopsony power in the undocumented labor market. We parameterize the policy as a decline in the elasticity ϵ_U .
- It is easy to show that the marginal cost of an undocumented worker ($MC_U = (1 + \epsilon_U)P_U^{-\epsilon_U}L_U^{\epsilon_U}$) is greater the higher the value of the labor supply elasticity.

$$\frac{dMC_U}{d\epsilon_U} > 0$$



15. Employment impact of regularization

Let R_ϵ denote a regularization policy that *reduces* the elasticity ϵ_U .

$$\frac{dL_U}{dR_\epsilon} > 0, \quad \frac{dL_H}{dR_\epsilon} > 0, \quad \frac{dL_A}{dR_\epsilon} > 0$$

The last two employment cross-effects must be positive as long as immigrants and other types of workers are not very strong substitutes.



16. Regularization in a competitive labor market

- Suppose regularization raises the cost of hiring an undocumented worker (e.g., employers must now pay payroll taxes for undocumented workers).
- A policy that raises the marginal cost of employing an undocumented worker reduces the demand for such workers.
- This reduction spills over to other sectors of the labor market if undocumented and authorized workers are not strong substitutes.
- In the end, the rise in the cost of undocumented labor shrinks the entire labor market and fewer workers of all types are employed.

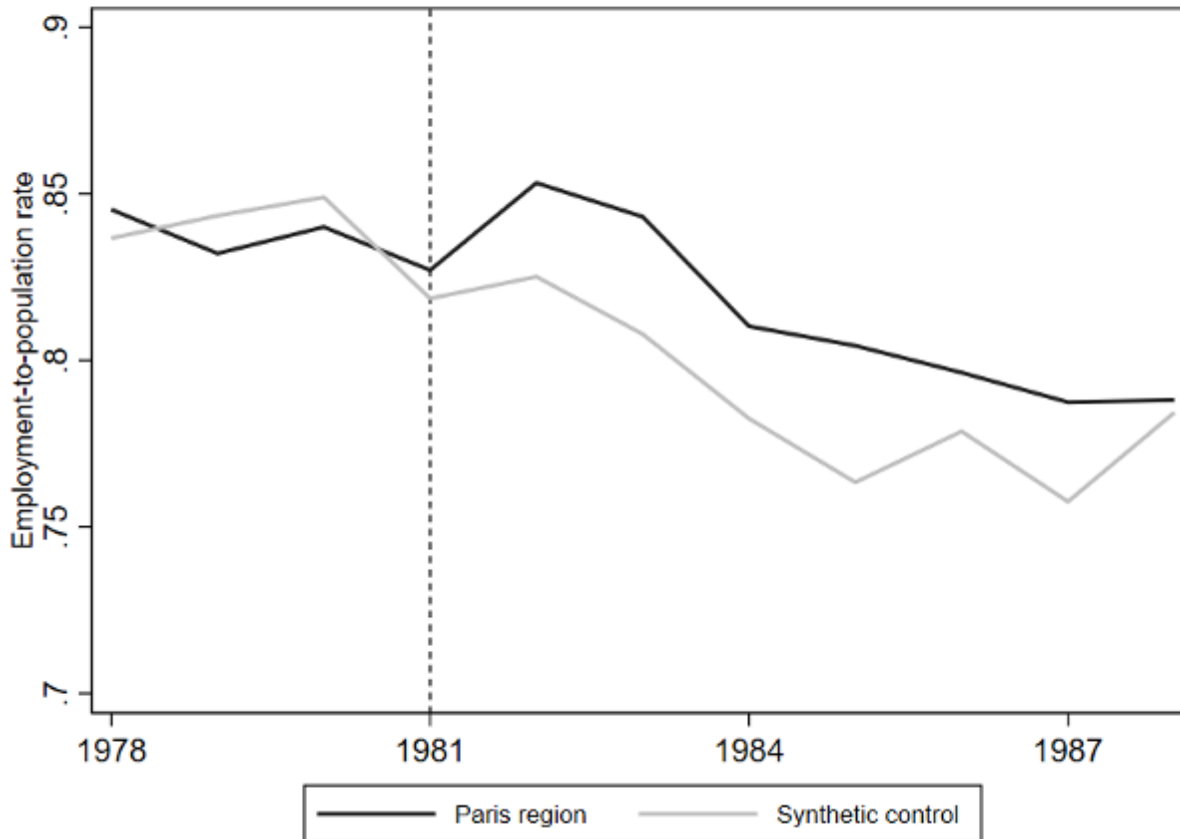


17. Data

- The French Labor Force Surveys (LFS) and the Déclaration Annuelle des Données Sociales (DADS).
- The LFS sample: persons aged 18-64 who are not self-employed, in military occupations, or enrolled in school.
- Two schooling groups: workers who have completed high school (by passing an exam called the “Baccalauréat” that gives access to college) and workers who have not. Only 24 percent of native workers in the 1982 census had passed the Baccalauréat.
- The LFS does not contain any wage information before 1982. The DADS allows us to estimate the wage consequences. The DADS is an administrative file of matched employer-employee records collected by the INSEE. We use the panel version of the DADS from 1978 to 1988, which samples the French workforce born in October in even-numbered years (about 4 percent of all workers).

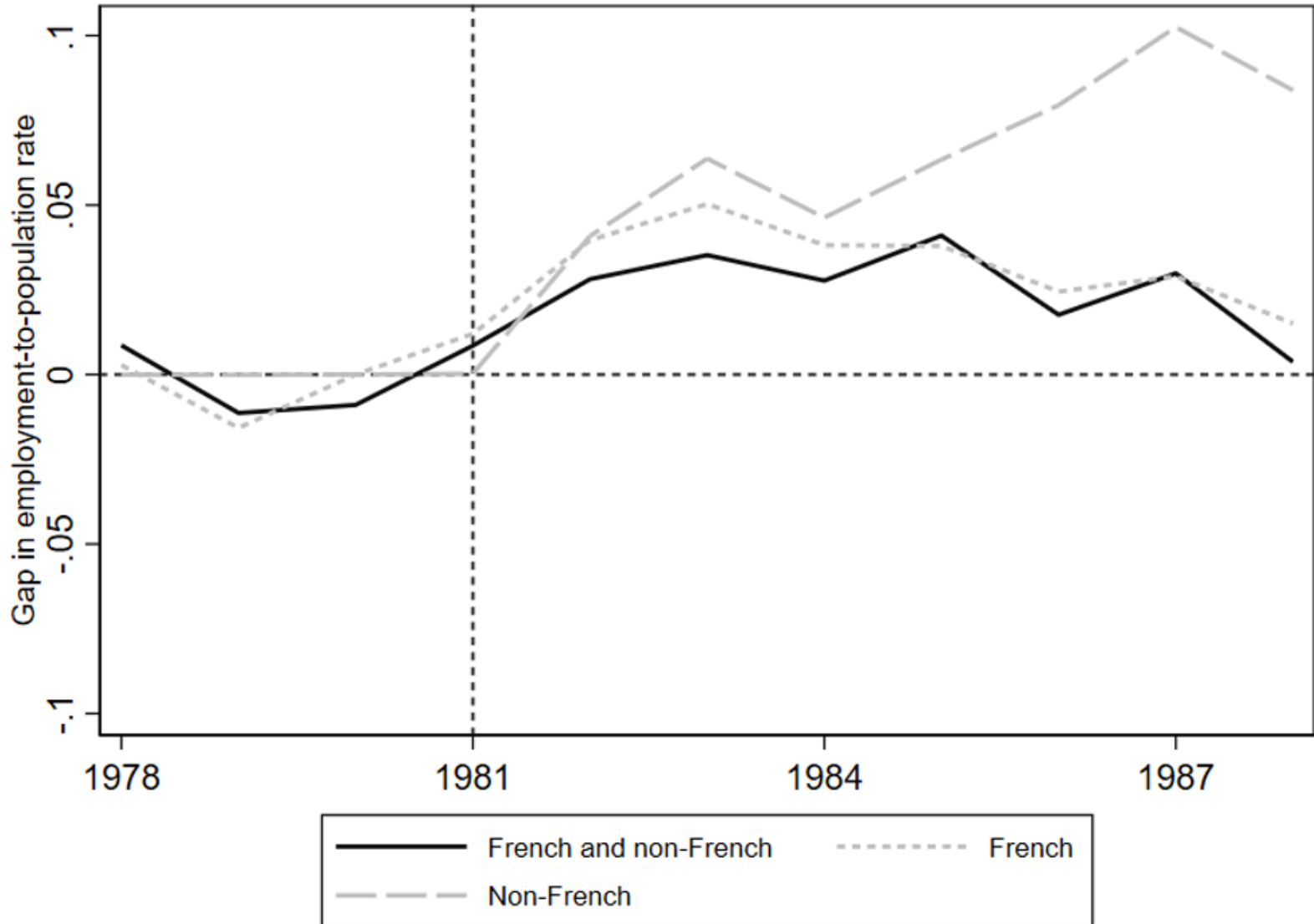
18. Trends in the employment rate of low-educated men in the treated and synthetic regions

A. All men (French and non-French)



Synthetic cohort: predictors are employment-population ratios, and change in employment and unemployment rates between 1978 and 1981. Initially exclude Marseilles from analysis.

19. Yearly gaps in the employment rate of low-educated men between the Paris region and its synthetic counterpart, by nationality group



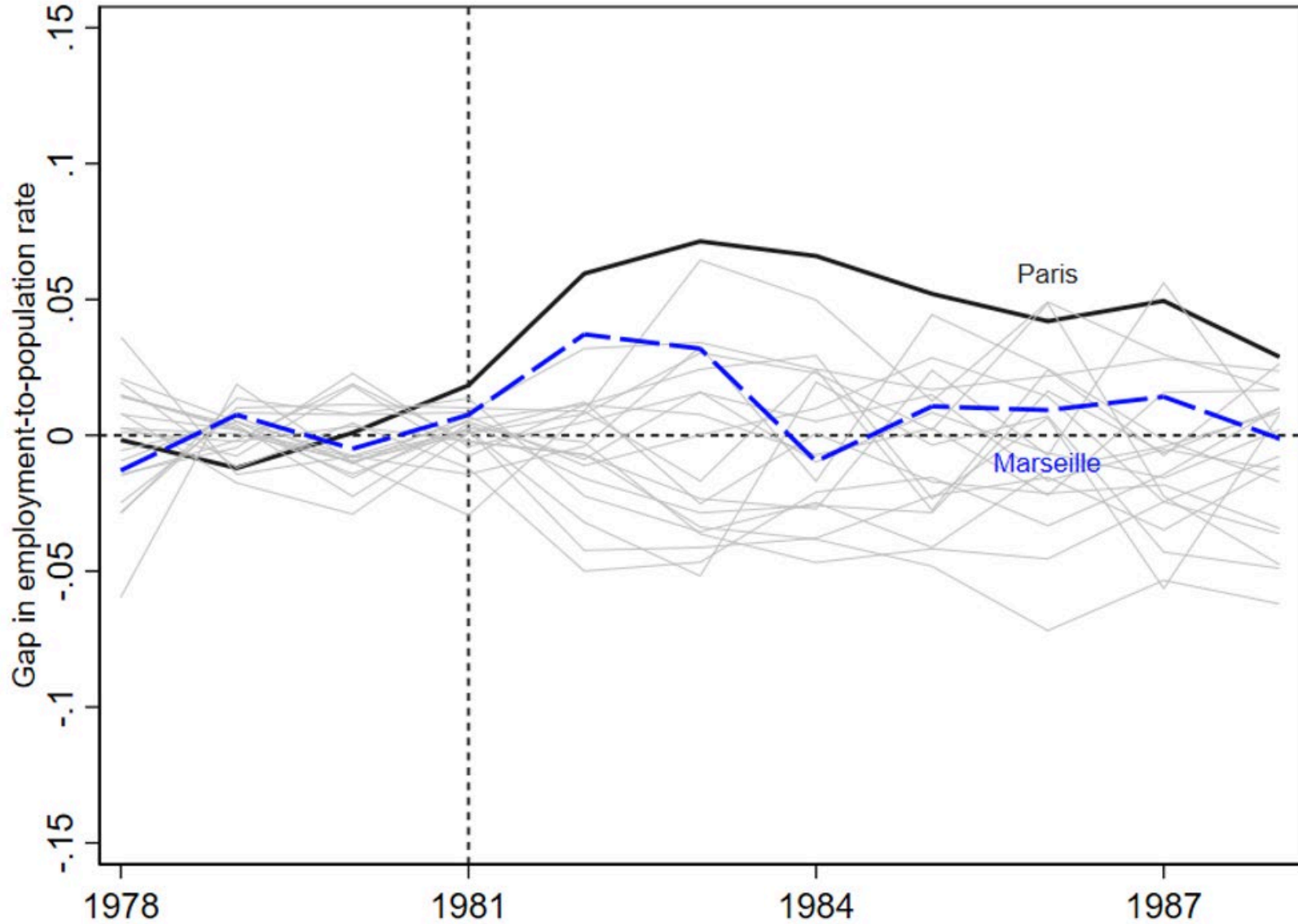
20. Yearly gaps in the employment rate between the Paris region and its synthetic counterpart, by education

A. Men



The “very low educated” includes those with only a primary education.

21. Impact of regularization in the Paris and Marseille regions



22. Impact on employment-to-population ratio, relative to synthetic region

	Men			Women		
	All	French	Non-French	All	French	Non-French
	(1)	(2)	(3)	(4)	(5)	(6)
A. Low-educated						
1982-1983	0.03** (0.01)	0.05*** (0.01)	0.05*** (0.02)	0.03* (0.01)	0.03* (0.01)	0.04 (0.05)
1984-1988	0.02** (0.01)	0.03*** (0.01)	0.08*** (0.02)	0.01 (0.02)	0.02 (0.02)	0.15** (0.07)
B. High-educated						
1982-1983	0.02*** (0.01)	0.02*** (0.01)	0.13*** (0.02)	-0.01 (0.01)	-0.02* (0.01)	0.21** (0.09)
1984-1988	0.01 (0.01)	0.01 (0.01)	0.13** (0.06)	-0.00 (0.01)	0.00 (0.01)	0.16** (0.07)

$$ER_{rt} = \theta_r + \theta_t + \beta_1(\text{Paris} \times T_{1982-1983}) + \beta_2(\text{Paris} \times T_{1984-1988}) + \varepsilon_{rt}, \quad (17)$$

23. Impact on employment-to-population ratio, relative to all regions

	Men			Women		
	All	French	Non-French	All	French	Non-French
	(1)	(2)	(3)	(4)	(5)	(6)
A. Low-educated						
1982-1983	0.04*** (0.01)	0.04*** (0.01)	0.03** (0.01)	0.01 (0.01)	0.01 (0.01)	0.02 (0.02)
<i>Wild bootstrap p-value</i>	<i>0.02</i>	<i>0.03</i>	<i>0.07</i>	<i>0.19</i>	<i>0.22</i>	<i>0.15</i>
1984-1988	0.04*** (0.01)	0.04*** (0.01)	0.06*** (0.01)	0.00 (0.01)	0.01 (0.01)	-0.01 (0.02)
<i>Wild bootstrap p-value</i>	<i>0.03</i>	<i>0.05</i>	<i>0.00</i>	<i>0.84</i>	<i>0.34</i>	<i>0.64</i>
B. High-educated						
1982-1983	0.02*** (0.01)	0.02*** (0.01)	0.08** (0.04)	-0.01 (0.01)	-0.01 (0.01)	0.07 (0.08)
<i>Wild bootstrap p-value</i>	<i>0.08</i>	<i>0.09</i>	<i>0.01</i>	<i>0.33</i>	<i>0.29</i>	<i>0.43</i>
1984-1988	0.01 (0.01)	0.01 (0.01)	0.09*** (0.03)	-0.00 (0.01)	0.00 (0.01)	0.09 (0.06)
<i>Wild bootstrap p-value</i>	<i>0.32</i>	<i>0.32</i>	<i>0.02</i>	<i>0.92</i>	<i>0.86</i>	<i>0.03</i>

24. Impact on wage of low-educated French workers

Cross-sectional results

All workers

Identification at infinity sample

Panel results

Synthetic

All regions

Synthetic

All regions

Synthetic

All regions

(1)

(2)

(3)

(4)

(5)

(6)

A. French men

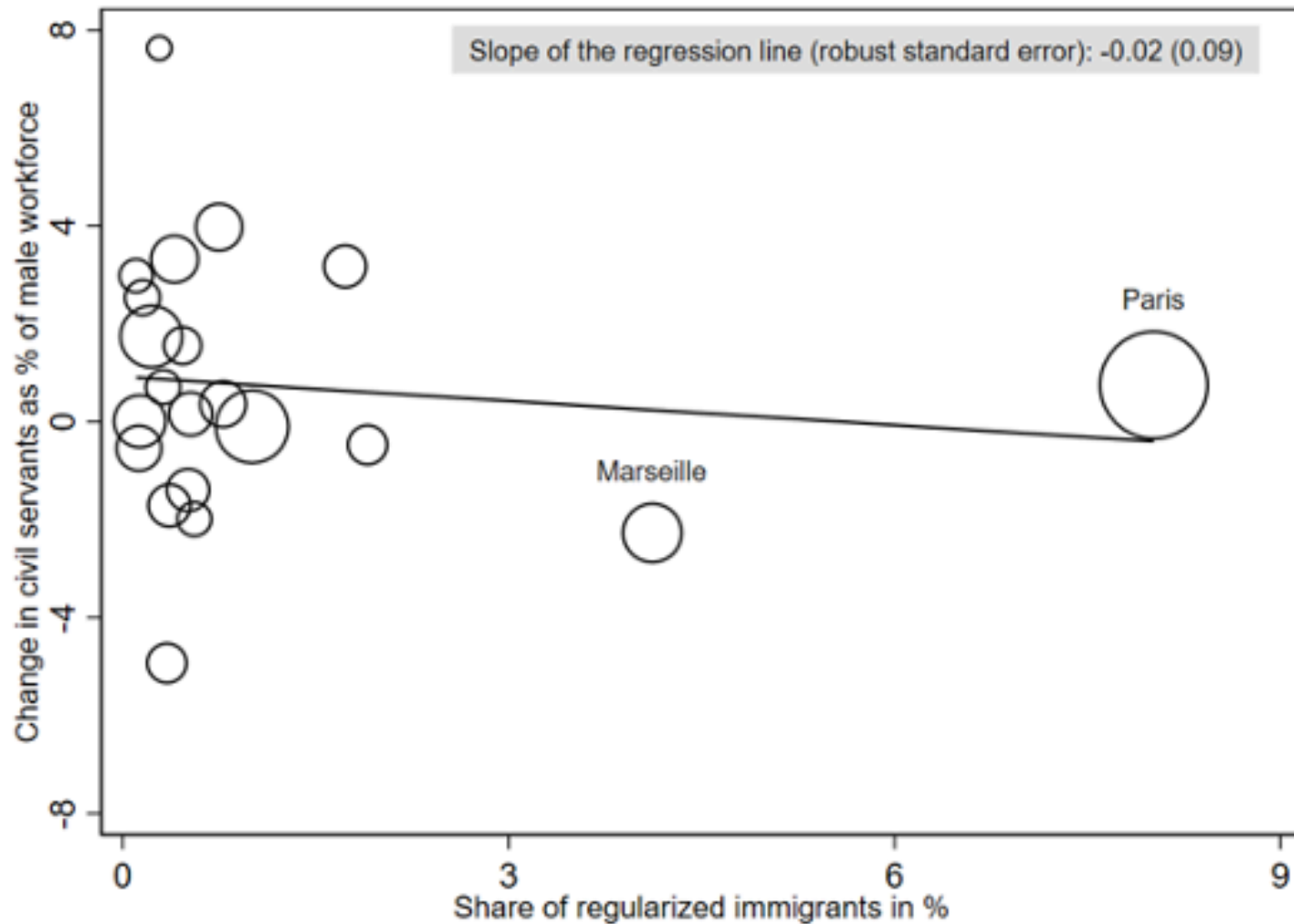
1984	-0.05*** (0.02)	-0.03* (0.02)	0.03** (0.01)	0.03* (0.02)	0.05* (0.03)	0.04** (0.02)
<i>Wild bootstrap p-value</i>	-	0.29	-	0.32	-	0.28
1985-1988	-0.05** (0.02)	-0.03** (0.02)	0.03* (0.01)	0.03** (0.01)	0.04 (0.03)	0.03 (0.02)
<i>Wild bootstrap p-value</i>	-	0.13	-	0.05	-	0.17

Identification-at-infinity sample: French men who had at least one child below 18.

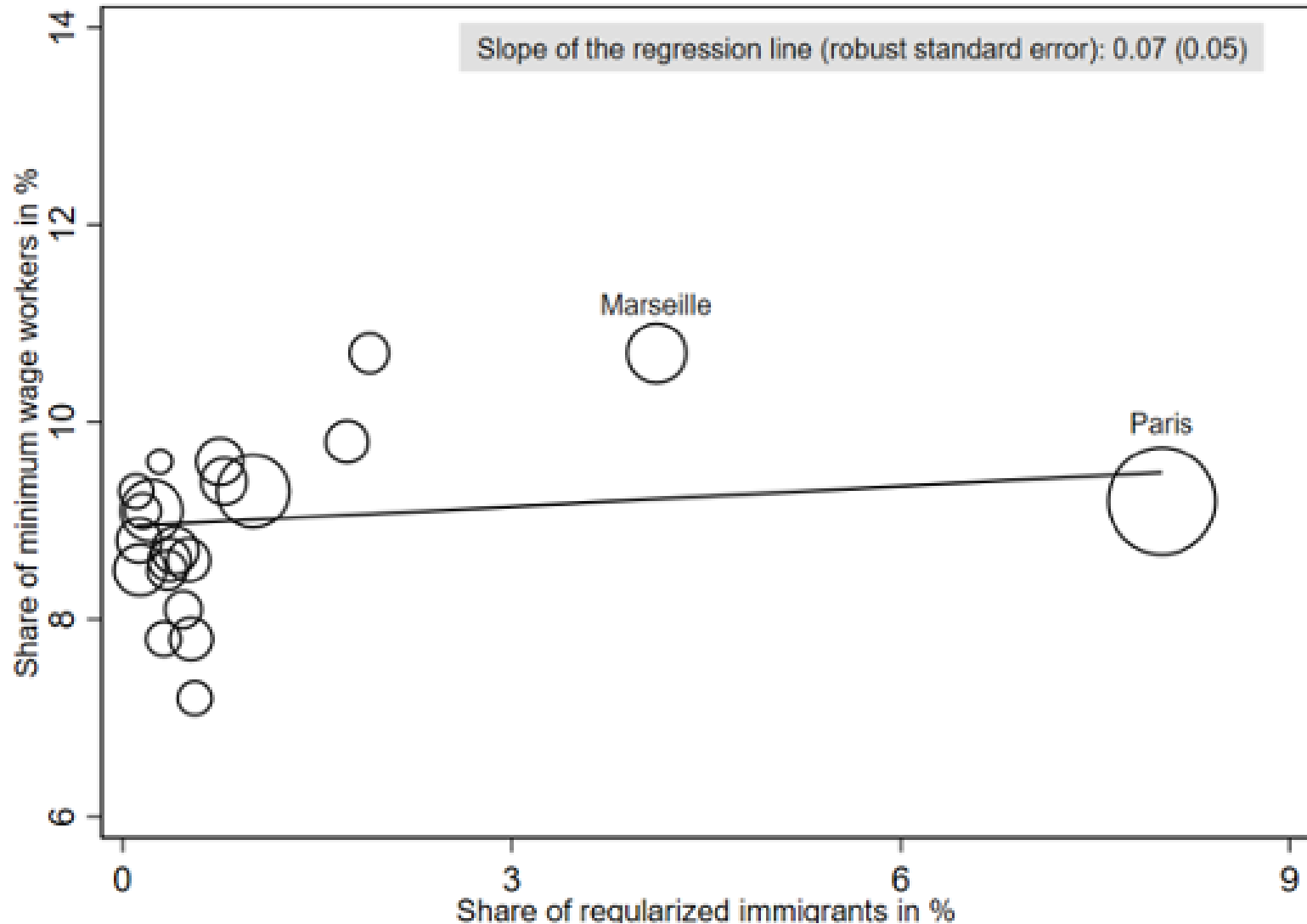
25. Employment impacts, Paris and Marseille

	Treated region			
	Paris		Marseille	
	Synthetic	All regions	Synthetic	All regions
	(1)	(2)	(3)	(4)
1982	0.058*** (0.01)	0.034*** (0.01)	0.038*** (0.01)	0.029*** (0.01)
<i>Wild bootstrap p-value</i>	-	0.195	-	0.350
1983	0.070*** (0.01)	0.053*** (0.01)	0.033** (0.01)	0.022* (0.01)
<i>Wild bootstrap p-value</i>	-	0.055	-	0.379
1984-1988	0.046** (0.02)	0.056*** (0.01)	0.006 (0.02)	0.004 (0.01)
<i>Wild bootstrap p-value</i>	-	0.003	-	0.476

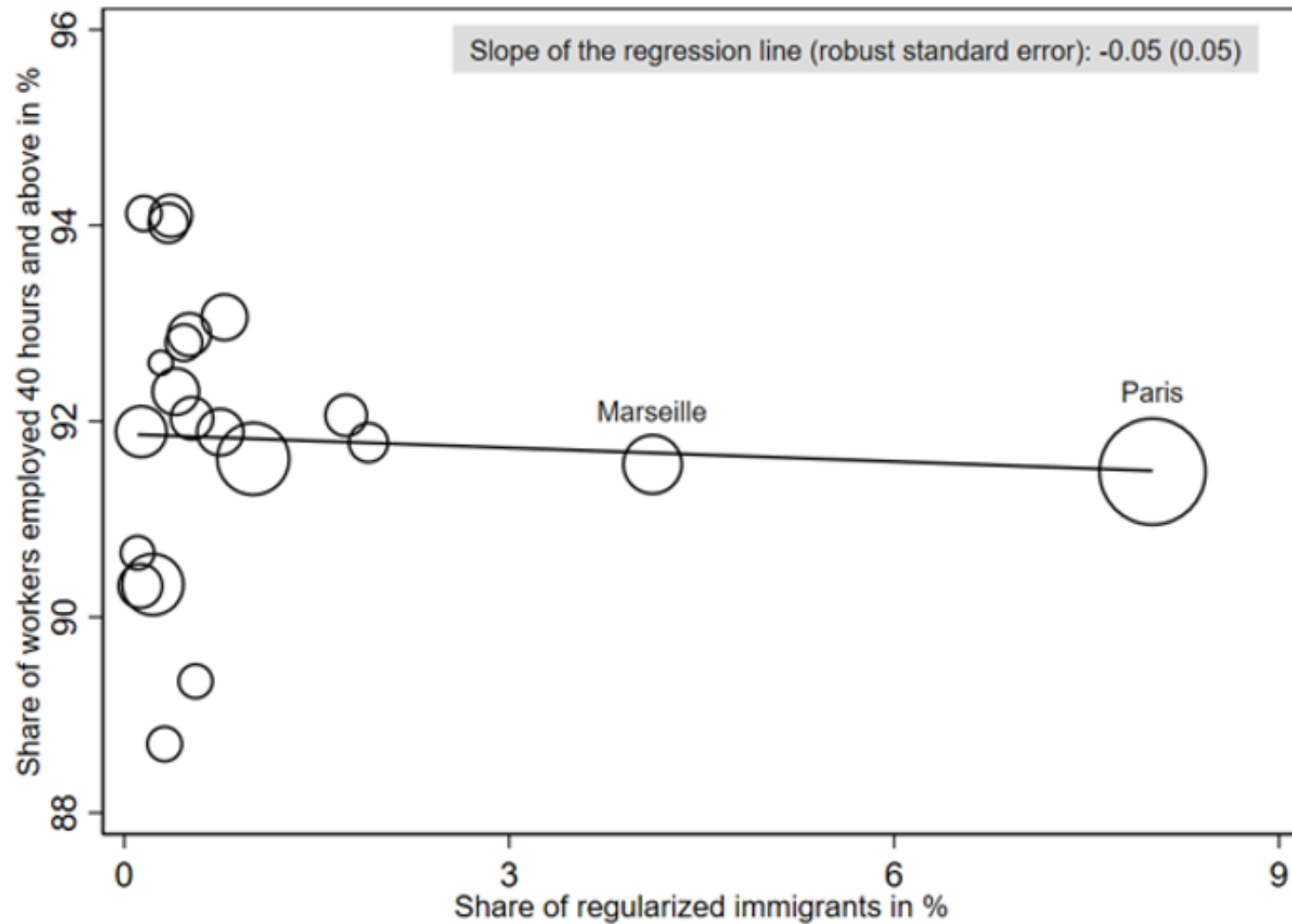
26. The share of regularized immigrants and the relative rise in the number of civil servants



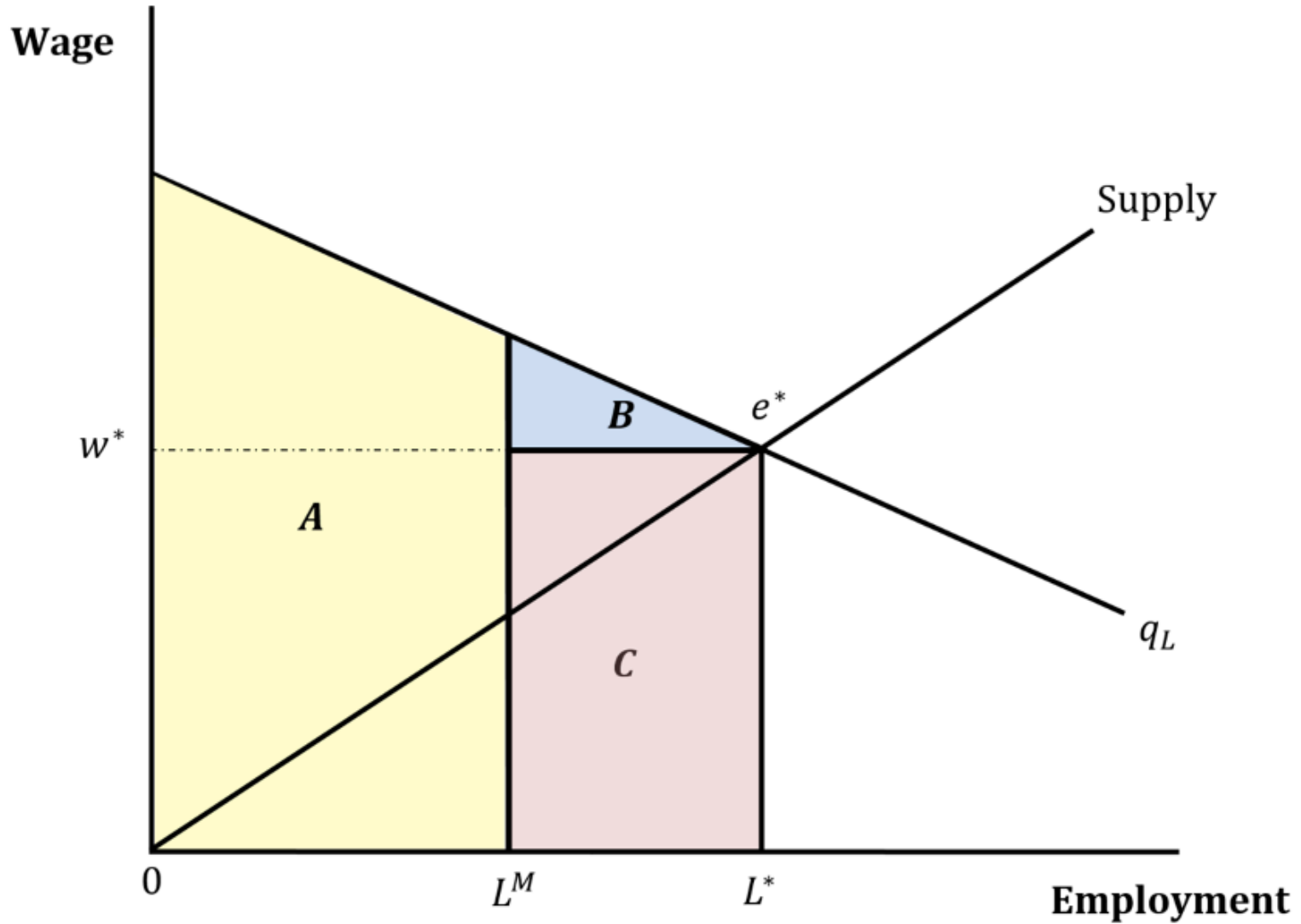
27. The share of regularized immigrants and the share of minimum wage workers



28. The share of regularized immigrants and the share working at least 40 hours



29. The regularization surplus



30. Impact on employment and per-capita GDP growth rates

Table 9: Impact on the change in employment and per-capita GDP growth rates

	Change in employment rate	Change in log GDP per-capita
	(1)	(2)
1982-1983	0.014** (0.01)	0.016** (0.01)
1984-1988	0.002 (0.01)	0.011 (0.01)
Implied elasticity	0.69	0.79



31. Estimating the regularization surplus

Method 1: The employment rate in Paris increased by 1.4 percentage points. The share of the regularized workforce in Paris was 2.02 percent, so the employment elasticity is 0.69 ($0.014/2.02\%$). The program increased the French employment rate by 0.56 percentage point (or $0.69 \times 0.81\%$). Suppose the share of labor income is 0.7; the inverse factor price elasticity is -0.3. The areas B and C represent an increase of 0.0003 ($-0.5 \times 0.7 \times -0.3 \times 0.0056^2 \times 100$) and 0.3921 ($0.7 \times 0.0056 \times 100$) percent of GDP, respectively. The regularization program increased French GDP by about 0.4 percent.

Method 2: Change in per-capita GDP in Paris was 1.6 percentage points higher. The share of regularized workers in the Paris workforce was 2.02 percent, so that the implied output elasticity is 0.79 ($0.016/2.02\%$). The regularization program increased French GDP by 0.64 percent ($0.79 \times 0.81\%$).

Implication: the exceptional regularization program increased French GDP by about 0.5 percent.



32. Conclusion

- What to do with the current stock of undocumented immigrants?
- This paper documents the economic consequences of a large regularization program implemented in France in July 1981.
- Undocumented immigration introduces a labor market inefficiency because employers may have monopsony power over the undocumented. The inefficiency can spill over to other sectors of the labor market, so that monopsony power in the undocumented sector curtails the hiring of both natives and authorized immigrants below what would otherwise be optimal.
- Regularization removes the inefficiency.
- Our empirical analysis shows that regularization had positive effects on the employment and wages of many groups, particularly for male, low-skill workers. Moreover, there was a sizable jump in the growth rate of per-capita GDP in the affected region, suggesting an increase in total French GDP of around 0.5 percent.



33. Policy implications

- The policy implications are less transparent than the “regularization expands the economy” take-away point would make it seem.
- The inefficiency would not have existed had there been no undocumented immigration in the first place.
- All that regularization does is return the post-supply-shock labor market to its competitive equilibrium, suggesting that there probably was a negative wage effect in the short run regardless.
- Amnesty programs may affect migration incentives in sending countries, perhaps creating new inefficiencies in the process.
- There are fiscal consequences (e.g., social expenditures and tax revenues) that need to be included in a full accounting of the costs and benefits of regularization policies.