# JOB MOBILITY AND WAGE DYNAMICS IN PORTUGAL

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**Project in partnership with GEE.** 









## Too Many Changes? Post-Displacement Job Mobility and Wages: an Analysis of Displaced Workers in Portugal



# Displacement

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## What is Displacement?

Job loss for reasons beyond workers' control

#### Mass Layoffs

#### **Firm Closures**

#### Abolishment of worker's position/shift

![](_page_3_Picture_5.jpeg)

## The Impact of Displacement on Wage Dynamics: Literature Review

## **Empirical Background: Displacement and Wage Dynamics**

#### John Addison and Pedro Portugal (1989)

Provide a foundation for the study of the impact displacement on workers' wage changes.

> Although displacement deeply declines earning prospects: Increased unemployment duration strongly reduces subsequent earnings meaning that the conventional path to this determination overstated results in previous attempts to do so.

#### Pedro Raposo, Pedro Portugal and Anabela Carneiro (2021)

The authors analyze the factors behind wage reductions among displaced workers.

the

The predominant factor contributing to monthly wage decrease among displaced workers is the transition to lower-paying job titles, constituting 37% of total average monthly wage decline, compared to 31% attributed to firm effects and 32% to match effects.

![](_page_5_Picture_8.jpeg)

# Job Mobility

![](_page_6_Picture_1.jpeg)

## **Definition of Mobility**

Movement of employees across grades, positions or even occupations.

Planned or unplanned mobility

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![](_page_7_Picture_4.jpeg)

## **Types of Mobility**

**By Direction: Intra and Inter Firm Job Mobility** 

Industrial: Mobility between industries with focus on inter firm mobility.

<u>Intra:</u> Job Mobility within the firm.

<u>Inter</u>: Job Mobilty between firms.

<u>Occupational</u>: Mobility between job occupations with focus on inter firm mobility.

<u>Geographical</u>: Mobility between job locations with focus also on inter firm mobility.

#### By Change: Industrial, Occupational and Geographical Mobility

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## The Impact of Job Mobility on Wage Dynamics: Literature Review

## **Empirical Background: Job Mobility and Wage Dynamics**

#### **Robert Topel (1991)**

#### John Addison, Pedro Portugal and Pedro **Raposo (2023)**

Proposes a dynamic wage model where wages rise with job seniority.

- Robust relationship between job tenure and wages increases, suggesting that workers accumulate job-specific human capital over time.
- > High separation rates from jobs with longer tenures suggest substantial losses in job-specific human capital upon job displacement.

- time.

The authors advance the traditional analysis by accounting for the possibility that wage change may occur with each job switch.

> Job mobility is an important driver of wage growth, particularly during the early stage of the worker, indicating declining return to job mobility over

![](_page_10_Picture_10.jpeg)

### **Empirical Background: Job Mobility and Wage Dynamics**

#### **Dulce Contreras, Rosario Sánchez** and Delfina Soria (2016)

Used the stochastic frontier technique to measure the gap between potential and actual wages.

- Spanish and Italian women, despite higher mobility exhibiting rates, encounter a widened gap between potential and actual wages.
- Mobility apparently fails to translate into expected wage benefits, especially for indicating systemic women, inefficiencies or barriers in the labor market's recognition.

- Supports

#### Justine Hervé (2023)

Analyses the impact of industrial specialization on job mobility and earnings for American workers in lowand middle- wage occupations.

Negative association between industry specificity and workers' wages.

the idea that industry specificity increases mobility costs.

![](_page_11_Picture_12.jpeg)

### **Empirical Background: Other Variables of Interest**

#### Gender

Women mobility does not improve their wage-earning path while for men, mobility reduces differences between the potential and the observed wage. -Contreras et. al (2016)

#### Tenure

Wage increases associated with job changes, especially in the early stages of a worker's career, indicating declining return to job mobility over time. - T. Addison, Portugal and Raposo (2023)

#### Institutions and Wage Level

Despite apparent rigidity, institutions in the Portuguese labour market leave ample scope for firm action when setting wages. - Cardoso (2006)

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## **Research Methodology**

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## Data

- Longitudinal microdata from a matched employer-employee-job title dataset known as *Quadros de Pessoal (QP, Lists of Personnel)* from 2010-2021;
- Information concerning workers encompasses gender, age, educational attainment, and comprehensive details regarding monthly earnings. This includes base wages, regular benefits (e.g., seniority bonuses), irregular benefits (such as profit shares and premiums), overtime compensations, and hours worked (both standard and overtime). Our primary findings rely on the hourly wage, which is computed as the total sum of regular (base wage and regular benefits) and irregular payroll (irregular benefits and overtime payments) for the reference hours worked;
- To be included in the sample, a worker must report positive earnings and have at least two years of tenure in the year immediately preceding the displacement event. Additionally, the worker must report positive earnings at least once afterward. The sample was limited to full-time wage earners in the private, non-farm sector, aged 16-64 years, employed at firms with at least 20 employees, and earning base wages above 80 percent of the mandatory minimum wage. Further restrictions included: (i) removing observations with missing values in the covariates and (ii) excluding singleton observations (groups reduced to a single observation that do not affect the coefficient estimates in the fixed effects model, particularly the coefficients of interest).

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## **Theoretical Framework**

#### **The Mincer Equation**

Mincer (1974), defined wages as a function of education and experience through the Mincer Equation and, through empirical application, found out that earnings rise with accumulated work experience.

#### The Augmented Mincer Equation

Mincer and Jovanovic (1981) then relate labor mobility and wage dynamics - the decline in labor mobility as individuals age is influenced by job tenure. Moreover, other authors contribute to findings that variables such as Gender and Firm Conditions also affect individuals wage dynamics.

### Raposo, Portugal and Carneiro (2021) & Bertheau et. al (2023)

These two papers use a transformed version of the Augmented Mincer Equation to study the consequences of job loss - respectively, the first introduces novel fixed effects and estimation strategy whilst the second one approximates to our event study objective (i.e. studying the effects of job loss and mobility over time).

![](_page_15_Picture_7.jpeg)

## **Estimation Strategy: Difference-in-Differences (DiD)**

#### **Firm Closures - Exogenous Shock DiD Analysis**

- To study the impact of mobility on wage dynamics we decided to look through the lens of displacement in light of recent literature mentioned previously.
- To do so, we use firm closures as an exogenous shock that allows us to draw comparisons between movers and non-movers in the post-displacement period, though impeding any mention of the intra vs inter-firm realm of mobility.

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#### Estimation Strategy: Difference-in-Differences (DiD)

#### <u>Step 1 - Generating a Firm</u> <u>Closure Exogenous Shock</u>

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## **Descriptive Statistics: Number of Displaced Workers**

	Non-Displaced	Disp
N	18,057,711 (80.6%)	4,351,52
Year of Reference		
2010	1,513,325	
2011	1,489,149	
2012	1,390,535	
2013	1,373,954	
2014	1,400,692	
2015	1,433,595	
2016	$1,\!475,\!650$	
2017	$1,\!530,\!480$	
2018	1,587,463	
2019	1,619,998	
2020	1,566,697	
2021	$1,\!676,\!173$	

Table 1: Displaced Workers by year of displacement

placed

28 (19.4%)

447,462428,102369,299358,925367,482372,549370,919372,495370,334348,533321,467223,961

![](_page_18_Picture_6.jpeg)

## Estimation Strategy: Difference-in-Differences (DiD)

#### **Step 2: Displaced and Non-Displaced Workers**

Grouping Workers By Displacement

Displaced Workers: job loss due to firm closure reported

Non-Displaced Workers: the remaining work force

![](_page_19_Picture_5.jpeg)

## **Characteristics of Displaced vs Non-Displaced Workers**

	Non-Displaced	Displaced
Ν	18,057,711 (80.6%)	4,351,528 (19.4%)
Gender		
Male	9,732,272 (53.9%)	2,395,693 (55.1%)
Female	8,325,439 (46.1%)	1,955,835 (44.9%)
Age (in years)	40.402 (10.945)	40.473 (10.303)
Education (in years)	10.196(3.924)	9.776 (3.812)
NUTS II Region where the establishment is located (October 31st)		
North Region	6,665,825 (36.9%)	1,680,584 ( $38.6%$ )
Algarve	776,785(4.3%)	197,326 (4.5%)
Centre Region	3,877,946 (21.5%)	842,385 (19.4%)
Lisbon Metropolitan Area	5,116,699 (28.3%)	1,203,458 (27.7%)
Alentejo	949,722 (5.3%)	232,515(5.3%)
Azores	287,087 (1.6%)	91,017 (2.1%)
Madeira	374,448 (2.1%)	102,292 (2.4%)
Outside of Portugal	9,199 (0.1%)	1,951 (0.0%)
Log of Real Hourly Total Remuneration (in 2012 Euros)	1.792(0.541)	1.671(0.492)
Turnover (Euros)	228,895,110.482 (858,966,645.493)	58,261,899.410 (351,900,294.819)
Tenure (in years)	9.426 (9.286)	6.953(7.893)

Table 2: Descriptive Statistics of Displaced and Non-Displaced Workers

*Note*: For the total number of workers, gender and region (NUTS II) variables the % of workers in each of the categorical distinctions is shown in the parenthesis. For the age, education, wage, turnover and tenure variables the parenthesis show the standard deviation of the variable.

![](_page_20_Picture_4.jpeg)

## Estimation Strategy: Difference-in-Differences (DiD)

#### **Step 3: The Target/Treatment Groups**

\*\*\*\*\*\*

Grouping Workers By Mobility

Geographical Mobility: Workers who moved to a different NUTS II region

Occupational Mobility: Workers who moved to a different CPP profession code (2 digits).

Industrial Mobility: Workers who moved to a different CAE activity (3 digits).

![](_page_21_Picture_6.jpeg)

## **Characteristics of Movers by Mobility Group**

- Around 5% of the sampled displaced workers changed occupation, around 1% moved from one region to another and approximately 4% experienced industrial mobility;
- Among <u>occupational movers</u>, the most representative occupations are FAB Intermediate Level Technicians and Fixed Plant and Machine Operators;
- Men make up the majority of <u>geographical movers</u> (around 2/3 of the displaced geographical movers) with the Lisbon MA (32.8%), Northern (28.7%) and Centre (21.9%) Regions comprising over 4/5 of the movers;
- In terms of industrial movers (IM), it is worth noting that the mean tenure of IMs (7.1 years) is half the mean tenure for Industrial Stayers (3.6 years). Moreover, the Construction (13.8%), Wholesale and Retail Trade, Repair of Motor Vehicles, Motorcycles and Personal and Household Goods (23.6%) and Real Estate, Renting and Business Activities (15.7%) industries account for over half of industry-level movements.

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![](_page_22_Picture_10.jpeg)

## **Estimation Strategy: Difference-in-Differences (DiD)**

#### **Step 4: Firm Closure - Exogenous Shock DiD Analysis**

$$w_{it} = \alpha_i + \lambda_t + \phi_{iF(i,t)} + \psi_{F(i,t)} + \sum_{k=-5}^{k=5} \gamma_k \mathbf{1}\{t = t_i^* + k\} + \sum_{k=-5}^{k=5} \theta_k \mathbf{1}\{t = t_i^* + k\} \times Mob_i + X'_{it}\beta + \epsilon_{it}$$

Where:

- $\alpha_i$  Worker Fixed Effects;
- $\lambda_{t}$  Time Fixed Effects;

 $\phi_{iF(i,t)} + \psi_{F(i,t)}$  • Worker-Firm Match Quality and Firm Fixed Effects, respectively;

 $X'_{ii}$  • Vector of control variables including age squared and occupational tenure.

(1)

![](_page_23_Picture_11.jpeg)

## **Hypotheses and Results**

![](_page_24_Picture_1.jpeg)

## Hypotheses

- "Experience/Human Capital Hypothesis" : Changing occupations will yield negative effects compared to those who do not change occupations;
- "Reputation/Bargaining Power Hypothesis" : Changing industries will give way to negative effects compared to those who do not change industries.
- "Disruption Hypothesis" : Moving from one region to another will yield adverse impacts in the short-run as opposed to not moving between different regions.
- "Gender Heterogeneous Vulnerability Hypothesis" : Given that women may be more strongly affected not only by displacement but also more vulnerable to the aforementioned effects we predict women will face more difficulties in the postdisplacement period.

![](_page_25_Picture_9.jpeg)

## **Results - Occupational Mobility**

#### 1. Remuneration Difference

![](_page_26_Figure_2.jpeg)

Before displacement (Years -6 to -1), the wage differences between movers and stayers are not significantly different from zero, indicating similar wage trajectories for both groups.

After displacement, workers who change occupations (movers) earn significantly less than those who do not change occupations, reaching a disparity of 1.5%.

Results are in line with the findings of Pedro Raposo, Pedro Portugal and Anabela Carneiro (2021) which conclude that this change ends up being the most significant change in workers post-displacement wage trajectories.

![](_page_26_Picture_6.jpeg)

## **Results - Occupational Mobility** 1. Remuneration Differences by Gender

![](_page_27_Figure_1.jpeg)

Wage Differences between (Occupational) Movers and Stayers for men

Wage Differences between (Occupational) Movers and Stayers for **women** 

# Women are the most affected by the loss of occupation specific capital or other factors related to occupational mobility. For men, although movers are worse off, the point estimates are not statistically significant.

For women, these points estimates are statistically significantly different from 0 at the 5% level and indicate that movers may earn up to 2% less than their female stayer and displaced peers.

![](_page_27_Figure_6.jpeg)

![](_page_27_Picture_7.jpeg)

## **Results - Industrial Mobility 1. Remuneration Difference**

![](_page_28_Figure_1.jpeg)

However, after displacement there also seems to be no significant difference between those who to another industry after move displacement and those who do not.

Wage Differences between (Industrial) Movers and Stayers

#### The assumption of parallel trends between treated and control units is predicted to hold true by looking at the non-significant differences between the treatment and control groups in the pre-displacement period, indicating that the coefficients of interest accurately capture the causal effect of moving industries.

![](_page_28_Picture_6.jpeg)

### **Results - Industrial Mobility**

#### **1. Remuneration Difference by Gender**

![](_page_29_Figure_2.jpeg)

Wage Differences between (Industrial) Movers and Stayers for **men** 

![](_page_29_Figure_4.jpeg)

The same conclusion holds true for both men and women, meaning that **moving industries** in the post-displacement period does not affect significantly the wage trajectories of those who do so compared to those who do not.

![](_page_29_Figure_6.jpeg)

Wage Differences between (Industrial) Movers and Stayers for women

![](_page_29_Picture_9.jpeg)

## **Results - Geographical Mobility** 1. Remuneration Difference

![](_page_30_Figure_1.jpeg)

The assumption of parallel trends between treated and control units is predicted to hold true yet again (presence of parallel pre-trends), indicating that the coefficients of interest accurately capture the causal effect of moving from one region to another in the postdisplacement period.

Movers, despite not differing significantly from stayers before displacement, are worse off after the displacement - though not significantly worse off for the majority of the years (except in the second and fourth years postdisplacement).

Wage Differences between (Geographic) Movers and Stayers

![](_page_30_Picture_5.jpeg)

## **Results - Geographical Mobility 1. Remuneration Difference by Gender**

![](_page_31_Figure_1.jpeg)

Wage Differences between (Industrial) Movers and Stayers for **men** 

![](_page_31_Figure_3.jpeg)

However, in line with the findings of Contreras, Sánchez and Sofia (2016), there are very distinct outcomes for men and women who move from one region to another. Whilst women who choose / are obliged to move after displacement are, in general, worse off compared to their women counterparts who did not choose / were not obliged to do so, men who move are actually significantly better off compared to men who do not.

Wage Differences between (Geographic) Movers and Stayers for **women** 

![](_page_31_Picture_7.jpeg)

## **Policy Implications** Occupational Mobility

'Severe losses in the returns to the job title may be due to depreciation of (occupation) specific human capital or to the difficulty of finding a new job requiring skills similar to those acquired in the pre-displacement job. Here, retraining programs may be of some help.' - Raposo, Portugal and Carneiro (2021)

Not only retraining programs can contribute to overcome the losses - on-the-job training, improved job matching services (both at the local and central levels), providing early access to potential employment (professional) networks and promoting a lifelong learning culture are all aspects where governments, either by direct intervention or by ways of subsidies, grants and other tools, can intervene to cushion the wage losses of displaced workers.

![](_page_32_Picture_3.jpeg)

## **Policy Implications Geographical Mobility**

Reasons why the barrier of (women's) geographic mobility might exist according to previous literature:

- Literature has shown that French women have a higher priority order in their wage reservation preferences for lower commute time/distance than men (Barbanchon et. al, 2021) and, thus, trade off lower commuting times for lower wages.
- Voldman (2020) and the National Women's Law Center (US, NWLC) (2021) relate labor and housing market outcomes whilst arguing that (french and american) women's discrimination in one of these markets leads to inequalities in the other.

![](_page_33_Picture_6.jpeg)

## **Discussion & Conclusion**

#### **Caveats of the Project**

The control variable choice, the chosen regression command/strategy and the initial data cleaning process, which, though referring back to Raposo, Portugal and Carneiro (2021), might have been misimplemented are some issues which need to be discussed to address the validity of our results.

#### **Directions for Future Research**

Given that there is still little research in Portugal about the consequences/results of the before mentioned retraining programs or regarding the gender disparities of geographical mobility, we think that, since the results on both topics are already established in previous literature it could be the next logical step to study these issues.

### **Open Questions & More Policy Implications**

Do you think that the premises discussed previously regarding policy implications (e.g. the fact about French women) is replicable/ted in Portugal? And what other reasonings behind these issues/policy implications might there be?

![](_page_34_Picture_7.jpeg)

# Thank You!

![](_page_35_Picture_1.jpeg)

# Appendix

![](_page_36_Picture_1.jpeg)

## **Characteristics of Occupational Movers vs Stayers**

Gender Male Female Age (in years) Education (in years) Portuguese Classification of Occupations (2-digits) Representatives of the legislature and executive bodies, senior leaders of the Public Administration, specialized organizations, directors and managers of companies Directors of administrative and commercial services Production and specialist service managers Hotel, catering, retail and other service managers Specialists in the physical, mathematical, engineering and related technical sciences Health Professionals Teachers Specialists in finance, accounting, administrative organization, public relations, and commercial (specialists) Information and Communication Technology (ICT) Specialists Experts in legal, social, artistic and cultural affairs Technicians and professions in science and engineering, intermediate level Technicians and professionals, intermediate level of health Intermediate level technicians from the financial, administrative and business areas Intermediate level technicians in legal, social, sporting, cultural and similar services Information and communication technology technicians Office workers, general secretaries, and data processing operators Direct customer support staff Data, accounting, statistical, financial services and related operators registration Other administrative support staff Personal service workers Sellers Personal care and similar workers Safety and security services personnel Farmers and skilled workers in agriculture and animal production, oriented towards the market Skilled market-oriented forestry, fishing and hunting workers Skilled construction and similar workers, except electricians Skilled workers in metallurgy, metalworking and the like Skilled workers in printing, precision instrument manufacturing, jewellers, craftsmen and the like Skilled electrical and electronics workers Workers in food processing, wood, clothing and other industries, and handicrafts Fixed plant and machine operators Assembling Workers Vehicle drivers and mobile equipment operators Cleaning Workers Unskilled workers in agriculture, animal husbandry, fisheries and forestry Unskilled workers in mining, construction, manufacturing and Transport Meal preparation assistants Street vendors (except food vendors) and street service providers Workers in waste and other basic services Log of Real Hourly Total Remuneration (in 2012 Euros) 57,894 Turnover (Euros) Tenure (in years)

Table 3: Descriptive Statistics for Displaced Occupational Stayers and Movers

**Note:** For the total number of workers, gender and occupation (CPP) variables the % of workers in each of the categorical distinctions is shown in the parenthesis. For the age, education, wage, turnover and tenure variables the parenthesis show the standard deviation of the variable.

Occupational Mobility Stayers Movers		
4,144,773 (95.2%)	206,755 (4.8%)	
2,285,550 (55.1%)	110,143 (53.3%)	
1.859.223 (44.9%)	96.612 (46.7%)	
40.473 (10.315)	40.471 (10.061)	
9.760 (3.812)	10.099 (3.797)	
24,680 (0.6%)	2,764 (1.3%)	
57.037 (1.4%)	4,900 (2.4%)	
37,060 (0.9%)	3,564 (1.7%)	
63,138 (1.5%)	5.234 (2.5%)	
80,990 (2.0%)	3.200 (1.6%)	
41,539 (1.0%)	1.626 (0.8%)	
32,144 (0.8%)	754 (0.4%)	
85,184 (2.1%)	5,904 (2.9%)	
52.626 (1.3%)	2.148 (1.0%)	
34,547 (0.8%)	1.096 (0.5%)	
144.899 (3.5%)	11,492 (5.6%)	
51,776 (1.2%)	2,888 (1.4%)	
163,549 (3,9%)	14.358 (7.0%)	
17.078 (0.4%)	1.522(0.7%)	
34,951 (0.8%)	1,707 (0.8%)	
238,082 (5,7%)	10.388 (5.0%)	
100,490 (2,4%)	4,519 (2.2%)	
155.034 (3.7%)	9,494 (4.6%)	
51,818 (1.3%)	5,168 (2.5%)	
286,958 (6.9%)	11,506 (5.6%)	
464,216 (11.2%)	13,974 (6.8%)	
77,412 (1.9%)	3.842 (1.9%)	
68,757 (1.7%)	574 (0.3%)	
15,829 (0.4%)	543 (0.3%)	
3,720 (0.1%)	184 (0.1%)	
265,741 (6.4%)	8,799 (4.3%)	
199,472 (4.8%)	5,583 (2.7%)	
34,009 (0.8%)	2,325 (1.1%)	
66,931 (1.6%)	2,853 (1.4%)	
251,040 (6.1%)	13,909 (6.7%)	
273,917 (6.6%)	14,142 (6.9%)	
31,043 (0.7%)	1,906 (0.9%)	
197,159 (4.8%)	3,858 (1.9%)	
135,962 (3.3%)	3,964 (1.9%)	
9,095 (0.2%)	453 (0.2%)	
133,995 (3.2%)	9,379 (4.5%)	
51,923 (1.3%)	3,799 (1.8%)	
5,292 (0.1%)	673 (0.3%)	
104,624 (2.5%)	11,375 (5.5%)	
1.670 (0.491)	1.691 (0.514)	
,604.552 (349,030,416.969)	65,623,865.722 (405,089,396.816)	
7.015 (7.917)	5.710 (7.293)	

![](_page_37_Picture_6.jpeg)

## **Characteristics of Geographical Movers vs Stayers**

	Geographical Mobility	
	Stayers	Movers
Ν	4.318.279 (99.2%)	33.249(0.8%)
Gender		
Male	2,373,171 (55.0%)	22,522 (67.7%)
Female	1,945,108 (45.0%)	10,727 (32.3%)
Age (in years)	40.474 (10.303)	40.336 (10.362)
Education (in years)	9.776 (3.811)	9.672 (3.948)
NUTS II Region where the establishment is located (October 31st		
North Region	1,671,056 (38.7%)	9,528 (28.7%)
Algarve	195,613 (4.5%)	1,713 (5.2%)
Centre Region	835,099 (19.3%)	7,286 (21.9%)
Lisbon Metropolitan Area	1,192,550 (27.6%)	10,908 (32.8%)
Alentejo	229,874 (5.3%)	2,641 (7.9%)
Azores	90,727 (2.1%)	290 (0.9%)
Madeira	101,720 (2.4%)	572 (1.7%)
Outside of Portugal	$1,640 \ (0.0\%)$	311 (0.9%)
Log of Real Hourly Total Remuneration (in 2012 Euros)	1.670 (0.491)	1.809 (0.550)
Turnover (Euros)	58,087,715.629 (352,045,132.763)	80,863,685.164 (331,801,854.191)
Tenure (in years)	6.967 (7.899)	5.182 (6.825)

Table 4: Descriptive Statistics for Displaced Geographical Stayers and Movers

Note: For the total number of workers, gender and region (NUTS II) variables the % of workers in each of the categorical distinctions is shown in the parenthesis. For the age, education, wage, turnover and tenure variables the parenthesis show the standard deviation of the variable.

![](_page_38_Picture_5.jpeg)

## **Characteristics of Industrial Movers vs Stayers**

	Industria	Industrial Mobility	
	Stayers	Movers	
Ν	4.188.862 (96.3%)	162.666 (3.7%)	
Gender	-, (/0)	, (,0)	
Male	2.303.032(55.0%)	92.661 (57.0%)	
Female	1.885.830 (45.0%)	70,005 (43.0%)	
Age (in years)	40,487 (10,308)	40,115 (10,166)	
Education (in years)	9.762 (3.813)	10.123 (3.767)	
Firm's Harmonized Sector of Economic Activity	(====)	()	
Mining and Quarrying of Energy Producing Materials	1(0.0%)	1(0.0%)	
Mining and Quarrying, Except of Energy Producing Materials	15.612(0.4%)	515 (0.3%)	
Manufacture of Food Products, Beverages and Tobacco	161.761 (3.9%)	5.249 (3.2%)	
Manufacture of Textiles and Textile Products	297.375 (7.1%)	5,950 (3.7%)	
Manufacture of Leather and Leather Products	96.026 (2.3%)	1.115 (0.7%)	
Manufacture of Wood and Wood Products	40.865 (1.0%)	1.252(0.8%)	
Manufacture of Pulp, Paper and Paper Products, Publishing and Printing	71,468 (1.7%)	1.373 (0.8%)	
Manufacture of Coke, Refined Petroleum Products and Nuclear Fuel	229 (0.0%)	18 (0.0%)	
Manufacture of Chemicals, Chemical Products and Man-Made Fibers	17.860 (0.4%)	780 (0.5%)	
Manufacture of Rubber and Plastic Products	26,914 (0.6%)	959 (0.6%)	
Manufacture of Other Non-Metallic Mineral Products	47.286 (1.1%)	1.115 (0.7%)	
Manufacture of Basic Metals and Fabricated Metal Products	118,486 (2.8%)	6,179 (3.8%)	
Manufacture of Machinery and Equipment n.e.c.	65.627 (1.6%)	3,720 (2.3%)	
Manufacture of Electrical and Optical Equipment	26.313 (0.6%)	1.053 (0.6%)	
Manufacture of Transport Equipment	27,410 (0.7%)	1,526 (0.9%)	
Manufacturing n.e.c.	80,437 (1.9%)	2.162(1.3%)	
Electricity, Gas and Water Supply	9,963 (0.2%)	379 (0.2%)	
Construction	457,390 (10.9%)	22.371 (13.8%)	
Wholesale and Retail Trade, Repair of Motor Vehicles, Motorcycles and Personal and Household Goo	ds 932.514 (22.3%)	38,387 (23.6%)	
Hotels and Restaurants	377,699 (9.0%)	15,164 (9.3%)	
Transport, Storage and Communications	182,139 (4.4%)	6,545 (4.0%)	
Financial Intermediation	98,099 (2.3%)	3.893(2.4%)	
Real Estate, Renting and Business Activities	587,942 (14.1%)	25,475 (15,7%)	
Public Administration and Defense, Compulsory Social Security	10.681 (0.3%)	65 (0.0%)	
Education	63,199 (1.5%)	3.028 (1.9%)	
Health and Social Work	209,942 (5.0%)	9,718 (6.0%)	
Other Community, Social and Personal Service Activities	159,158 (3.8%)	4,506 (2.8%)	
Extra-Territorial Organizations and Bodies	62 (0.0%)	0 (0.0%)	
Log of Real Hourly Total Remuneration (in 2012 Euros)	1.669(0.492)	1.716 (0.487)	
Turnover (Euros)	57,279,227.646 (347.926.305.847)	83,543,259,736 (441,271,930,323)	
Tenure (in years)	7.082 (7.913)	3.641 (6.535)	

Table 5: Descriptive Statistics for Displaced Industrial Stayers and Movers

Note: For the total number of workers, gender and industry (CAE) variables the % of workers in each of the categorical distinctions is shown in the parenthesis. For the age, education, wage, turnover and tenure variables the parenthesis show the standard deviation of the variable.

![](_page_39_Picture_5.jpeg)

![](_page_40_Figure_0.jpeg)

Figure 10: Wage Differences between (Geographic) *Movers* and *Stayers* Without Controls

Note: The coefficients of interest  $\theta_k$  are represented by the point estimates of the graph. The coefficients are in percentage units (i.e. difference in % between both groups' earnings). The confidence intervals are represented at the 95% confidence level. As observable, the non-inclusion of the control variables vector does not change the outcome of the investigation, though we feel that it is important to include the vector of control variables in accordance with the literature on the topic. The fixed effects are necessary to control for individual and time-specific characteristics of the workers, firm characteristics and match quality effects.

![](_page_41_Figure_0.jpeg)

Figure 11: Wage Differences between (Industrial) Movers and Stayers Without Controls

*Note*: The coefficients of interest  $\theta_k$  are represented by the point estimates of the graph. The coefficients are in percentage units (i.e. difference in % between both groups' earnings). The confidence intervals are represented at the 95% confidence level. As observable, the non-inclusion of the control variables vector does not change the outcome of the investigation, though we feel that it is important to include the vector of control variables in accordance with the literature on the topic. The fixed effects are necessary to control for individual and time-specific characteristics of the workers, firm characteristics and match quality effects.

![](_page_42_Figure_0.jpeg)

Figure 12: Wage Differences between (Occupational) Movers and Stayers Without Controls

**Note:** The coefficients of interest  $\theta_k$  are represented by the point estimates of the graph. The coefficients are in percentage units (i.e. difference in % between both groups' earnings). The confidence intervals are represented at the 95% confidence level. Regarding occupational mobility, we can see that the inclusion of the control variables are key to the results - if not for their inclusion, the parallel pre-trends assumption would be violated and, therefore, preclude any causal inference on the effect of occupational mobility. Furthermore, we argue even further - we believe that there might be other variables unaccounted for, given the point estimates for the remuneration difference pre-displacement seen in 7. Because we are unsure which control(s) we are missing, we have decided to not include variables in a "trial and error" fashion, though we admit that this could be investigated further and is a major weakness of the report. The fixed effects are necessary to control for individual and time-specific characteristics of the workers, firm characteristics and match quality effects and also contribute to the failure of the pre-trends assumption.