ZEW/IAB Workshop on
Spatial Dimensions of the Labour Market
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Workers' Mobility and Internal Labour Markets

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Workers' Mobility
and
Internal Labour Markets

1. **Intra-firm and Inter-firm mobility: who's moving?**
   - Theoretical background and objectives
   - Models and empirical results

2. **Returns to mobility: the effect of workers' mobility on wages**
   - Theoretical background and objectives
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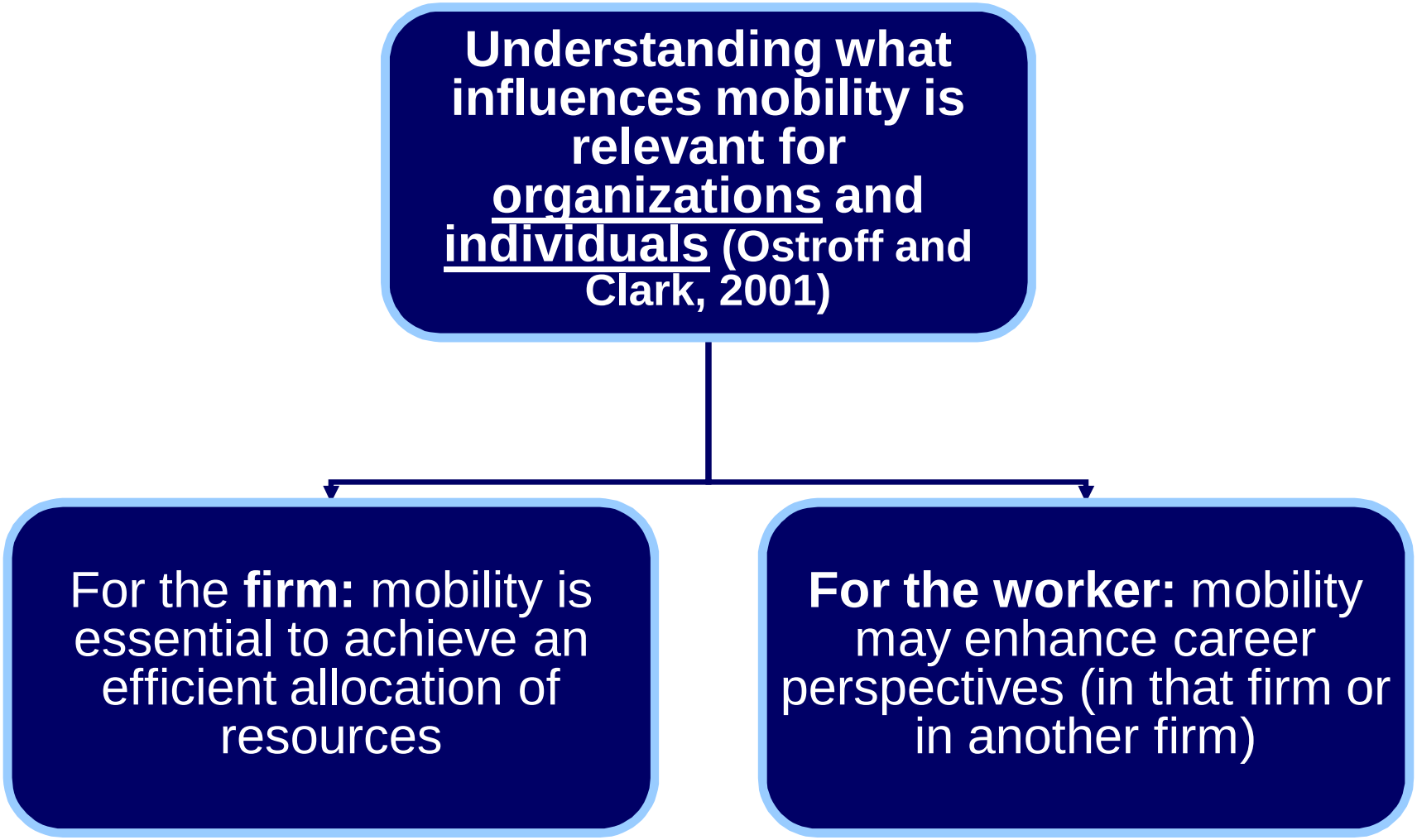
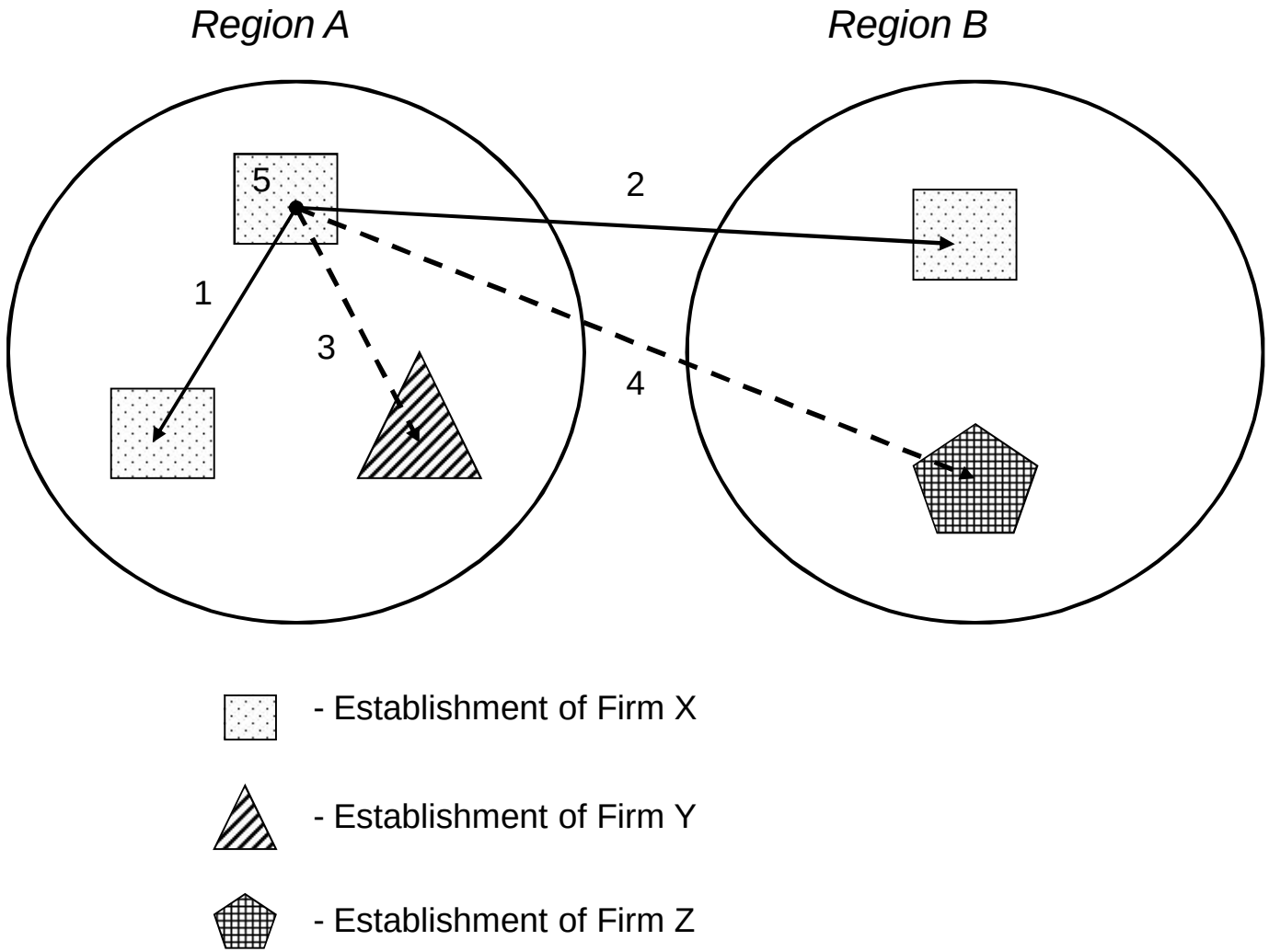


1. Intra-firm and Inter-firm mobility: who's moving?

- To analyze mobility probabilities, we defined the following classification:

Type 1	**Same-employer transfers without region change**: workers that perform a local change of establishment within the same firm
Type 2	**Same-employer transfers with region change**: workers that perform a non-local change of establishment within the same firm
Type 3	**Employer change without region change**: workers that change firm within the same region
Type 4	**Employer change with region change**: workers that change firm and also change region
Type 5	**Base category**: employees that remain in the same establishment of the same firm

1. Intra-firm and Inter-firm mobility: who's moving?



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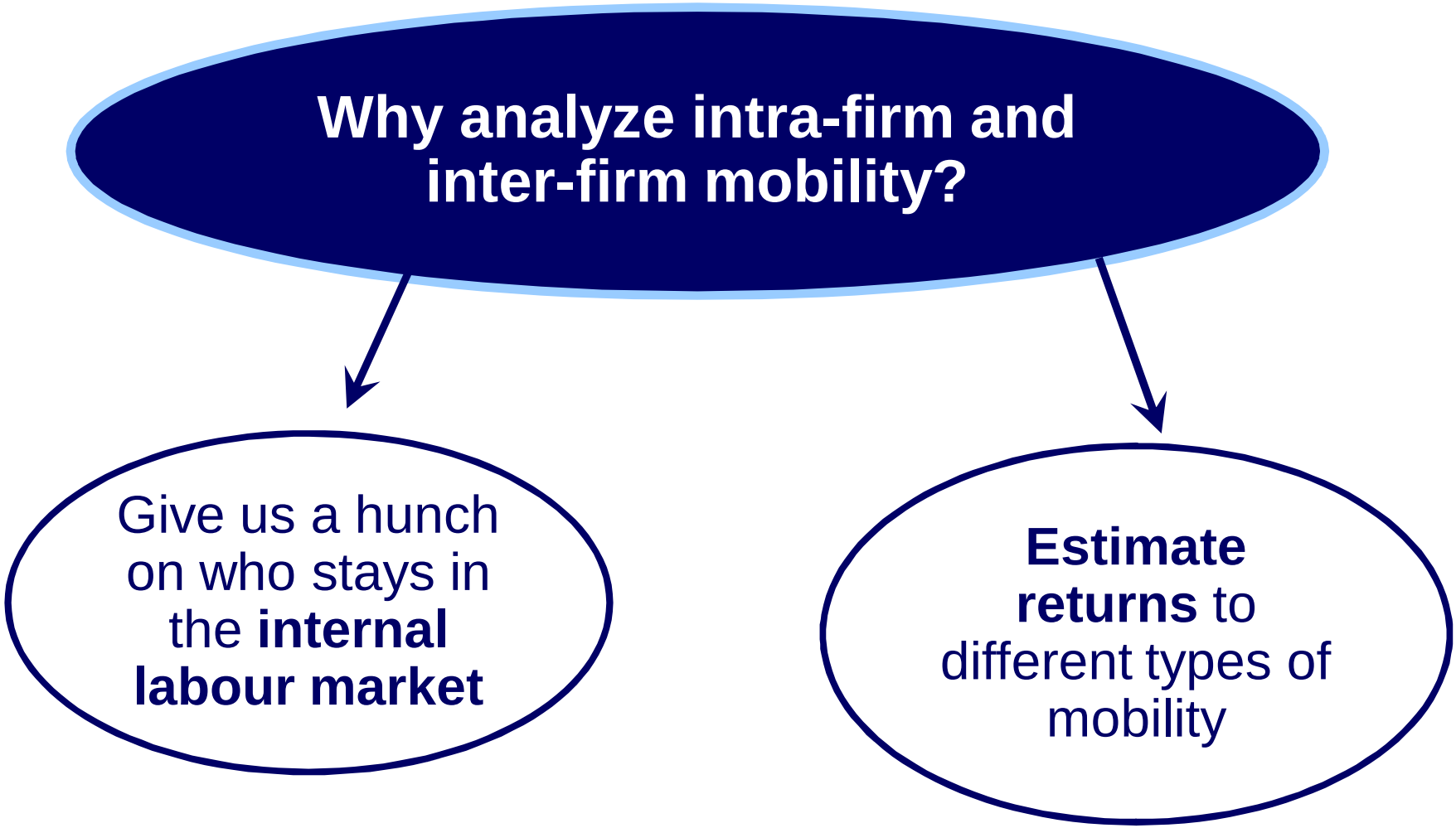

1. Intra-firm and Inter-firm mobility: who's moving?

Internal Labour Market

- Internal labour market's literature often explores the existence of an **internal job ladder**

- Focus on **promotion dynamics** and careers (within the same establishment)

(McCue, 1996; Pergamit and Veum, 1999; Lazear and Oyer, 2004; Lima, 2004; Lima and Centeno, 2003)

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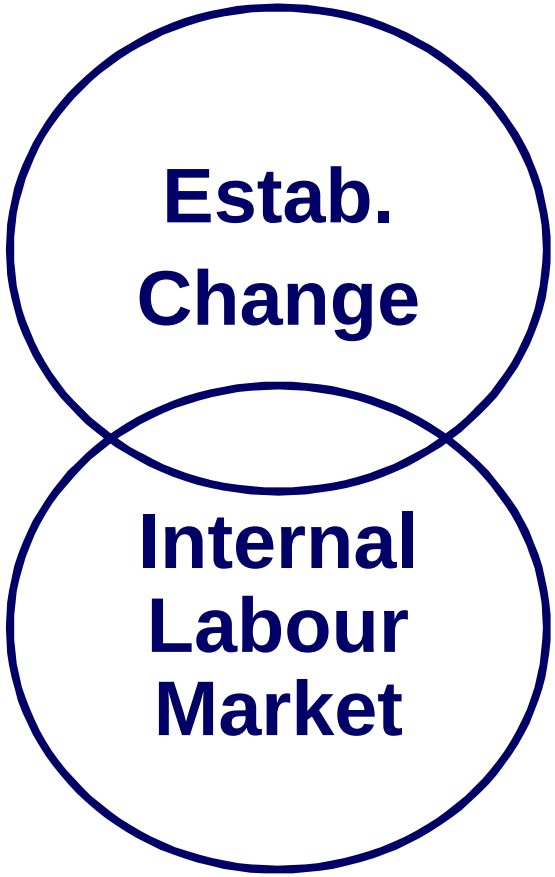
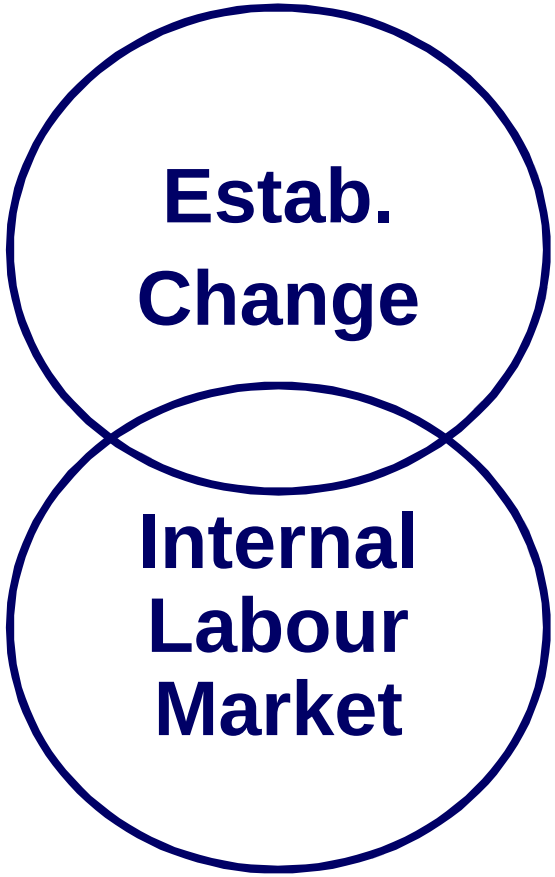


- Proposing a **different outlook on intra-firm mobility**

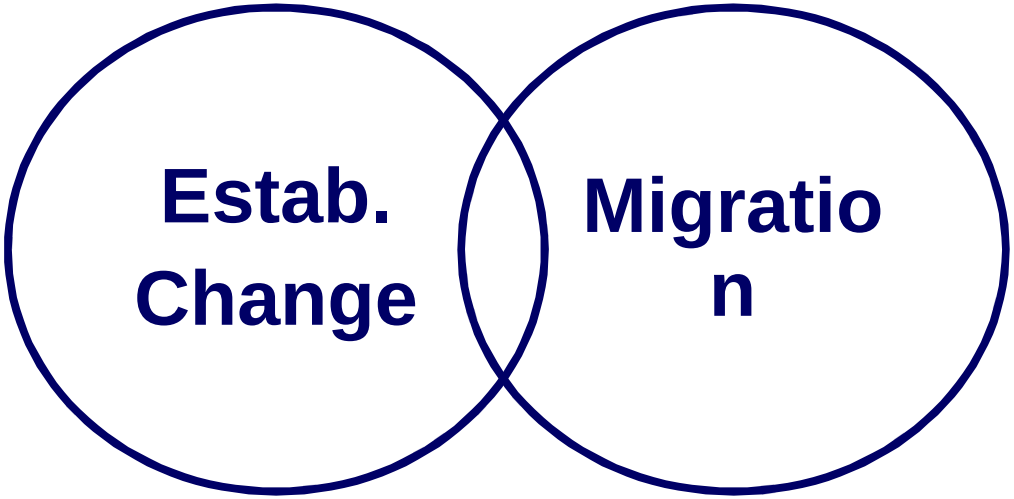
- The novelty in our approach is to focus on internal mobility that involves **an establishment change**

1. Intra-firm and Inter-firm mobility: who's moving?



- Although **with distinct features**, these transfers are also a way to move within the internal labour market of a firm
- In **multi-plant firms**, internal labour markets don't have to be restricted to **one** particular establishment
- In multi-plant firms the internal labour market may be based **on the firm as a whole**

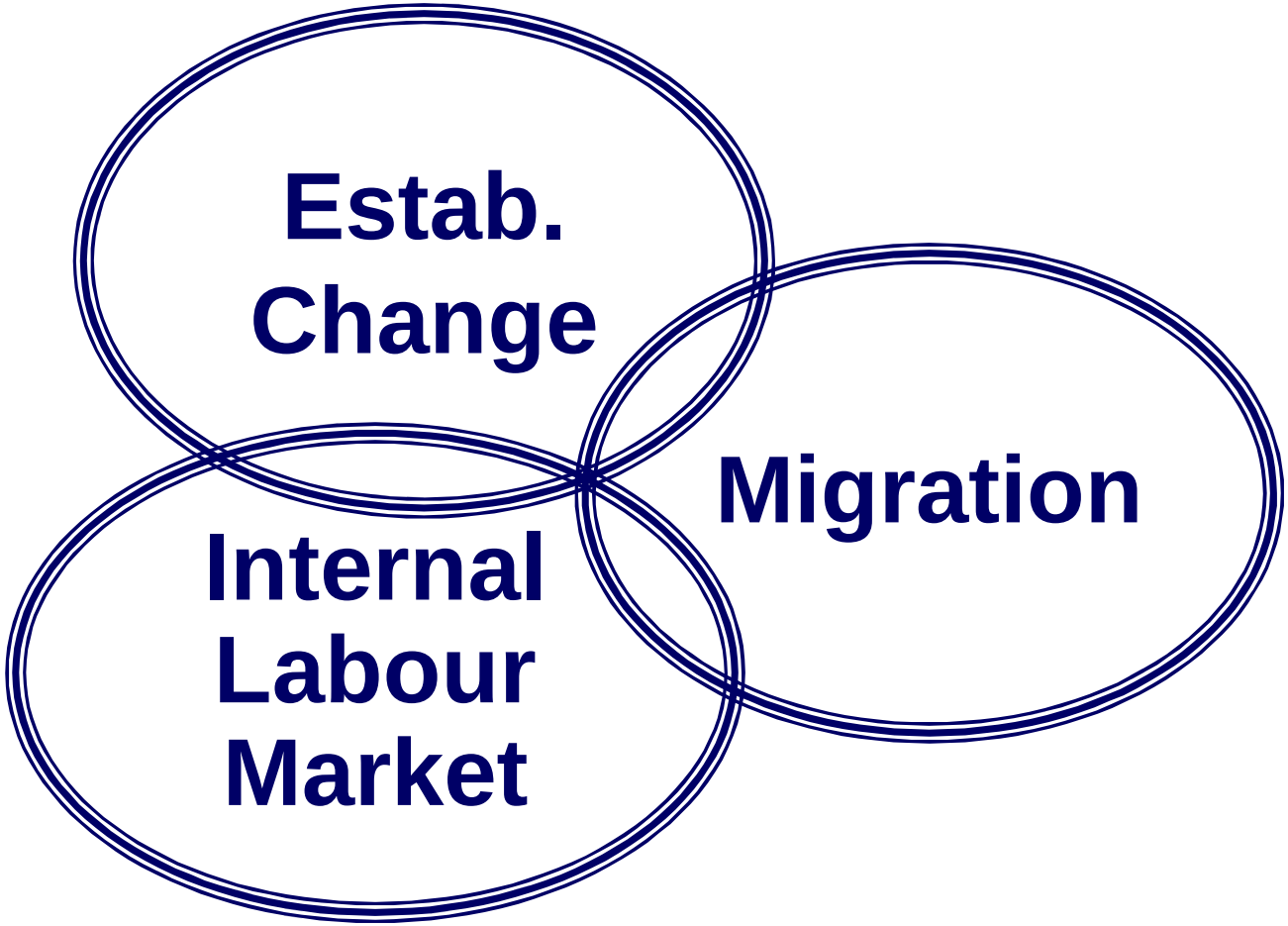
1. Intra-firm and Inter-firm mobility: who's moving?



Only a few studies report results for these group of movers (**Bartel, 1979; Hunt, 2004**)

These papers focus on the relation between estab. transfers and **migration literature** rather than looking at them as movements in the **internal labour market**

1. Intra-firm and Inter-firm mobility: who's moving?



1. Intra-firm and Inter-firm mobility: who's moving?

- **Bartel (1979)**
  - Analyzes **migration** together with **job mobility** decisions
  - Distinguishes three kinds of migrations: **quits, layoffs and transfers** (workers that migrated without changing employer)

1. Intra-firm and Inter-firm mobility: who's moving?

- **Hunt (2004)**
  - Inter-state migration (move to a non-contiguous county) within western Germany, using the German Socio-Economic Panel from 1984–2000.
  - Once again, reports conclusions mobility type 2
  - Transfer goes together with migration - ***same-employer migrants***
  - Her paper was a step forward in migration literature:
    - Most previous literature focused on the link between **migration** and **inter-firm mobility**
    - She explores the link between **migration** and **intra-firm mobility**

The data

- Quadros de Pessoal (QP) – a matched employer-employee dataset
- QP is an annual mandatory employment survey collected by the Portuguese Ministry of Employment that every firm with wage earners has to fill in
  - The data does not cover family business without wage-earning employees, self-employed workers and public administration.
- The data are collected once per year in October.
- Measurement errors should be reduced as employers must post the information contained in the survey in a public place inside the firm.

The data

- We use data from 1999 to 2005, but for the year 2001 data on workers is not available
- Firms, establishments and workers have unique identification numbers which allow us to track and match them over time
- The data includes:
  - Firm-specific information (location, industry, number of establishments, employment, sales, ownership, legal setting, etc.)
  - Establishment-specific details (number of workers, location, activity, etc.)
  - Workforce characteristics (gender, age, schooling, occupation, tenure, earnings, hours of work, etc.)

The data

The **treatment group**:

- The worker remains with the same employer in 1999 and 2000 but is transferred to another establishment of the same firm
  - **Multi-plant firms** in 1999: ensures that all analyzed workers could carry out all the mobility types
  - Change **was not caused by the closure of the establishment** where the individual previously worked, as this transfer is **not completely volunteer**

1. Intra-firm and Inter-firm mobility: who's moving?

- To study mobility probabilities we will use the **multinomial logit model (MNL,** Schmidt and Strauss, 1975)

- Let *y* denote a random variable taking values {0,1,...,J} for J a positive integer
  - In our model *y* will denote the type of mobility performed by the worker with J=4

- Let **X** denote a set of regressors.
  - In our model **X** will contain individual specific variables and firm characteristics'

1. Intra-firm and Inter-firm mobility: who's moving?

- We are interested in how, *ceteris paribus*, changes in the elements of **X** affect the response probabilities, P(*y*=j|**X**) , j=0,1,2,...,J
- MNL model has response probabilities:

$$P(y=j|X)=\frac{e^{x\beta_j}}{1+\sum_{h=1}^{J}e^{x\beta_h}}$$

- We can compute the odds-ratios:

$$\frac{P_j(x,\beta)}{P_0(x,\beta)}=e^{x\beta_j}$$

1. Intra-firm and Inter-firm mobility: who's moving?

- Two definitions of region change:

1. **Change in the district** were the individual works (18 districts in mainland Portugal, Madeira, Açores and foreign country)

2. Workplace change to a **non-contiguous district**

Variables definition

Tenure 200	Tenure less than 200 months
Tenure 400	Tenure between 200 and 400 months in the previous year
Age	Worker's age in years in the previous year
Age squared	Square of worker's age (divided by100) in the previous year
Female	Gender dummy equal 1 for female in the previous year
Education 4	4 or less years of schooling
Education 9	6 or 9 years of schooling
Education 12	12 years of schooling
Nationality	Dummy equal 1 for foreign worker
Promotion [-3,0]	Dummy equal 1 if the worker was promoted in the previous 3 years

Variables definition

$\ln W\_p$	Regular real hourly wage in the previous year
Size	Firm size in the previous year (log number of workers)
Tenure months	Tenure in months
Tenure months squared	Squared tenure in months (divided by100)
SE_same_reg$_X$	Dummy equal 1 X years after changing estab. in the same region
SE_change_reg$_X$	Dummy equal 1 X years after changing estab. with region change
Change emp_same_reg$_X$	Dummy equal 1 X years after changing employer in the same region
Change emp_change_reg$_X$	Dummy equal 1 X years after changing employer with region change
Est.Conc.	Concentration of establishments of the same firm in the region
var_workers_est	Average establishment's growth (in number of workers) in the previous 3 years

If the variable is added the suffix _p it means it concerns to the previous year

MNL Results (2nd definition of region change)

Log pseudL	-855751,11
Prob>X^2	0,0000
Pseudo R^2	0,0727
N	1205379

	mobility = 1		mobility = 2		mobility = 3		mobility = 4	
Indep. var.	Coef.	t-ratio	Coef.	t-ratio	Coef.	t-ratio	Coef.	t-ratio
Tenure200_p	0,1811***	(7,43)	0,1871***	(2,55)	0,1285***	(3,88)	1,5040***	(5,60)
Tenure400_p	-0,0003	(-0,01)	-0,0952	(-1,35)	0,3200***	(10,09)	0,7096***	(2,64)
Age_p	0,0043	(1,59)	0,0173**	(2,05)	-0,0813***	(-27,24)	-0,1271***	(-11,09)
Age squar_p	-0,0111***	(-3,39)	-0,0383***	(-3,77)	0,0631***	(17,14)	0,1183***	(8,15)
Female_p	-0,0739***	(-9,80)	-0,2318***	(-9,37)	-0,0275***	(-3,22)	-0,2265***	(-6,33)
Educ4_p	0,0526***	(3,24)	0,3059***	(6,28)	-0,3077***	(-16,13)	-0,5515***	(-7,39)
Educ9_p	-0,0790***	(-5,86)	-0,1175***	(-2,75)	-0,2698***	(-17,69)	-0,5984***	(-9,58)
Educ 12_p	-0,0390***	(-3,12)	-0,2231***	(-5,41)	-0,2144***	(-15,20)	-0,4709***	(-8,40)
Nationality_p	0,2589***	(7,07)	0,3650***	(4,24)	0,4905***	(12,65)	0,3229**	(2,35)
Prom [-3,0]	-0,0072	(-1,19)	-0,1057***	(-5,92)	-0,4602***	(-56,27)	-0,6768***	(-20,31)
ln W_p	-0,2045***	(-21,78)	-0,0341	(-1,31)	-0,1886***	(-17,23)	-0,3969***	(-8,65)
Size_p	0,1180***	(49,64)	0,0285***	(3,07)	-0,0134***	(-4,94)	-0,1024***	(-9,38)
Est.Conc._p	0,5358***	(41,55)	-2,3431***	(-48,38)	0,2691***	(18,40)	0,2156***	(3,46)
Constant	-2,4012***	(-38,74)	-3,3570***	(-16,98)	0,4461***	(6,31)	-1,3583***	(-3,85)

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2. Returns to mobility: the effect of workers' mobility on wages

- Most existing literature focus on **returns** for **two** broad kinds of mobility:

Migrations and, in most studies, this implies inter-firm mobility

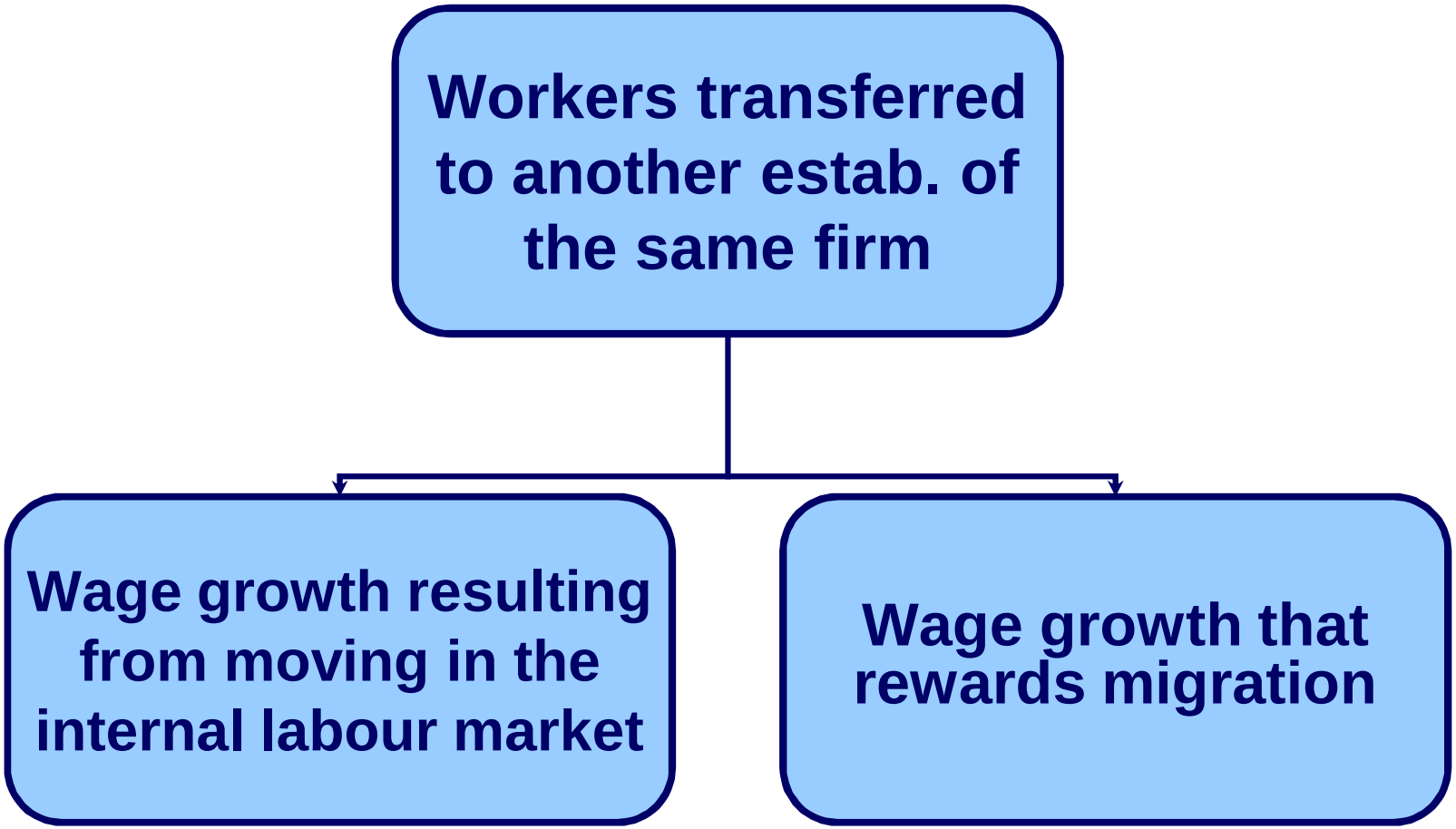
(Shaw, 1991; Farber, 1983; Yankow, 2003)

Internal mobility and, in most studies, this implies mobility within the same establishment

(Lima, 2004; Lima and Pereira, 2003; Hegedus & Hartman, 1992)

2. Returns to mobility: the effect of workers' mobility on wages

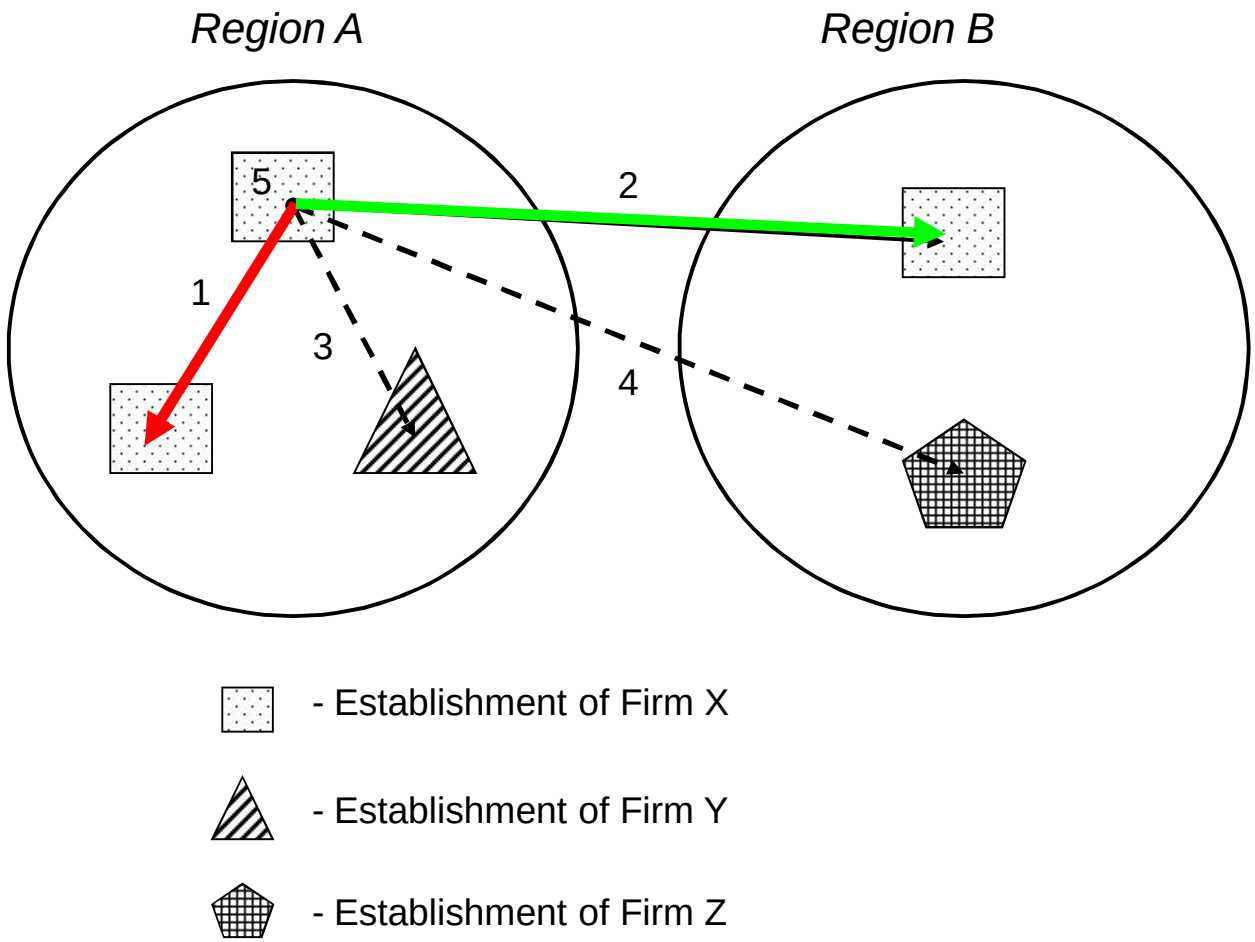
- Distinguish returns to different types of mobility:



2. Returns to mobility: the effect of workers' mobility on wages

- Propose a **new approach to measure migration premiums:**
  - Compare the wage premium of workers that are locally transferred with the premium of individuals that are transferred to another region
    - The first premium will be related to movements in the internal job ladder
    - The **additional wage growth** when the transfer involves a region change will measure the **migration premium**

2. Returns to mobility: the effect of workers' mobility on wages



2. Returns to mobility: the effect of workers' mobility on wages

Background…

- Yankow (2003) suggests a way to measure migration premiums by comparing returns across local and non-local **job changers**

- May include greater uncertainty as several variables that affect returns may be difficult to control

We believe that comparing workers that remain **with the same employer** allow us to better isolate the additional **migration premium**

2. Returns to mobility: the effect of workers' mobility on wages

- We started by an OLS equation capturing the **difference in earnings** for the different types of mobility considered:

$$\ln W_{it} = \beta_1 X_{it} + \beta_2 Z_{it} + \sum_{k=0}^{4} SESR_{it}^{k}\delta_k + \sum_{k=0}^{4} SECR_{it}^{k}\lambda_k + \sum_{k=0}^{4} CESR_{it}^{k}\alpha_k + \sum_{k=0}^{4} CECR_{it}^{k}\tau_k + \gamma_t + \varepsilon_{it}$$

OLS (1st def.)

Independent variables	Coef.	t-ratio
SE_same_reg$_0$	-0,0051***	(-3,09)
SE_same_reg$_1$	0,0037*	(1,90)
SE_same_reg$_2$	-0,0014	(-0,65)
SE_same_reg$_3$	0,1239***	(4,15)
SE_same_reg$_4$	0,0199***	(4,02)
SE_change_reg$_0$	0,0532***	(15,61)
SE_change_reg$_1$	0,0593***	(13,26)
SE_change_reg$_2$	0,0620***	(10,91)
SE_change_reg$_3$	0,0631***	(8,38)
SE_change_reg$_4$	0,0692***	(4,82)
Age	0,0461***	(108,62)
Age squared	-0,0413***	(-80,01)
Female	-0,2741***	(-214,09)
Education 4	-1,1596***	(-449,64)
Education 9	-0,8659***	(-358,57)
Education 12	-0,5778***	(-226,56)
Tenure months	0,0010***	(53,54)
Tenure squared	-0,0001***	(-14,90)
Size	0,0375***	(116,99)
var_workers_est	0,0002	1,22
Change emp_same_reg$_0$	0,0347***	(15,13)
Change emp_same_reg$_1$	0,0662***	(28,07)
Change emp_same_reg$_2$	0,0743***	(32,14)
Change emp_same_reg$_3$	0,0789***	(26,39)
Change emp_same_reg$_4$	0,1001***	(21,82)
Change emp_change_reg$_0$	0,0421***	(8,92)
Change emp_change_reg$_1$	0,1010***	(15,95)
Change emp_change_reg$_2$	0,1006***	(13,36)
Change emp_change_reg$_3$	0,0932***	(9,73)
Change emp_change_reg$_4$	0,0928***	(5,12)
Constant	1,1579***	(138,02)
$\overline{R}^2$	0,5673	
N	1752951	

OLS (2nd def.)

Independent variables	Coef.	t-ratio
SE_same_reg$_0$	-0,0046***	(-2,89)
SE_same_reg$_1$	0,0020	(1,11)
SE_same_reg$_2$	-0,0018	(-0,85)
SE_same_reg$_3$	0,0089***	(3,10)
SE_same_reg$_4$	-0,0197***	(-4,06)
SE_change_reg$_0$	0,1017***	(20,75)
SE_change_reg$_1$	0,1416***	(20,36)
SE_change_reg$_2$	0,1534***	(16,11)
SE_change_reg$_3$	0,1469***	(11,46)
SE_change_reg$_4$	0,1583***	(7,82)
Age	0,0461***	(108,59)
Age squared	-0,0412***	(-79,99)
Female	-0,2741***	(-214,28)
Education 4	-1,1589***	(-449,43)
Education 9	-0,8653***	(-358,34)
Education 12	-0,5774***	(-226,46)
Tenure months	0,0010***	(53,52)
Tenure squared	-0,0001***	(-14,84)
Size	0,0375***	(116,94)
var_workers_est	0,0002	1,17
Change emp_same_reg$_0$	0,0347***	(15,72)
Change emp_same_reg$_1$	0,0674***	(30,25)
Change emp_same_reg$_2$	0,0739***	(32,56)
Change emp_same_reg$_3$	0,0774***	(26,48)
Change emp_same_reg$_4$	0,0984***	(21,76)
Change emp_change_reg$_0$	0,0609***	(7,21)
Change emp_change_reg$_1$	0,1221***	(12,92)
Change emp_change_reg$_2$	0,1489***	(11,99)
Change emp_change_reg$_3$	0,1573***	(9,57)
Change emp_change_reg$_4$	0,1413***	(4,51)
Constant	1,1582***	(138,11)
$\bar{R}^2$	0,5677	
N	1752651	

2. Returns to mobility: the effect of workers' mobility on wages

- We estimated a regression with **individual-specific effects**
- Fixed effects estimates of mobility dummies do not have a direct interpretation since they represent within-individual earnings changes
- Nevertheless, fixed effects estimates, although showing smaller effects, show consistent differences between same employer transfers with and without region change.

Fixed-effects (1st def.)

Independent variables	Coef.	t-ratio	Tenuremonths	0,0004***	(25,79)
SE_same_reg$_0$	0,0135***	(13,62)	Tenuresquared	0,0000**	(2,00)
SE_same_reg$_1$	0,0214***	(17,63)	Size	0,0345***	(108,30)
SE_same_reg$_2$	0,0222***	(15,61)	var_pest_medium	0,0003***	3,46
SE_same_reg$_3$	0,0337***	(18,49)	Change emp_same_reg$_0$	0,0192***	(14,79)
SE_same_reg$_4$	0,0235***	(7,92)	Change emp_same_reg$_1$	0,0468***	(33,34)
SE_change_reg$_0$	0,0231***	(12,39)	Change emp_same_reg$_2$	0,0668***	(45,05)
SE_change_reg$_1$	0,0257***	(10,06)	Change emp_same_reg$_3$	0,0719***	(39,12)
SE_change_reg$_2$	0,0333***	(10,14)	Change emp_same_reg$_4$	0,0832***	(27,71)
SE_change_reg$_3$	0,0401***	(6,88)	Change emp_change_reg$_0$	0,0194***	(7,70)
SE_change_reg$_4$	0,0471***	(6,58)	Change emp_change_reg$_1$	0,0633***	(18,47)
Age	0,0452***	(107,17)	Change emp_change_reg$_2$	0,0768***	(19,02)
Age squared	-0,0304***	(-59,59)	Change emp_change_reg$_3$	0,0778***	(14,69)
Education 4	-0,0862***	(-32,16)	Change emp_change_reg$_4$	0,0751***	(7,54)
Education 9	-0,0778***	(-31,60)	Constant	0,3143***	(33,28)
Education 12	-0,0629***	(-27,79)	N	1752661	

Fixed-effects (2nd def.)

Independent variables	Coef.	t-ratio	Tenure months	0,0004***	(25,61)
SE_same_reg$_0$	0,0126***	(13,38)	Tenure squared	0,0000**	(2,15)
SE_same_reg$_1$	0,0200***	(17,16)	Size	0,0345***	(108,26)
SE_same_reg$_2$	0,0216***	(15,86)	var_pest_medium	0,0003***	3,46
SE_same_reg$_3$	0,0317***	(18,12)	Change emp_same_reg$_0$	0,0203***	(16,24)
SE_same_reg$_4$	0,0243***	(8,49)	Change emp_same_reg$_1$	0,0494***	(35,52)
SE_change_reg$_0$	0,0393***	(15,60)	Change emp_same_reg$_2$	0,0657***	(46,22)
SE_change_reg$_1$	0,0461***	(12,59)	Change emp_same_reg$_3$	0,0716***	(40,02)
SE_change_reg$_2$	0,0518***	(10,53)	Change emp_same_reg$_4$	0,0822***	(28,01)
SE_change_reg$_3$	0,0503***	(7,68)	Change emp_change_reg$_0$	0,0053	(1,46)
SE_change_reg$_4$	0,0592***	(5,82)	Change emp_change_reg$_1$	0,0540***	(10,78)
Age	0,0452***	(107,29)	Change emp_change_reg$_2$	0,0914***	(14,61)
Age squared	-0,0304***	(-59,69)	Change emp_change_reg$_3$	0,0932***	(11,30)
Education 4	-0,0882***	(-32,15)	Change emp_change_reg$_4$	0,1007***	(6,34)
Education 9	-0,0778***	(-31,59)	Constant	0,3138***	(33,23)
Education 12	-0,0629***	(-27,78)	N	1752651	