

Local labour markets and spatial determinants of overeducation

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Summary

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Background

Overeducation: having an educational level higher than the one required for the job one's occupy (McGuinness, 2006; Kucel, 2011)

- Influence of several characteristics:
 - socio-demographic - *gender, age* (Baert *et al.*, 2013);
 - education-related - *level of schooling, field of study* (Meroni & Vera-Toscano, 2017);
 - job-related - *part-time/full-time, permanent/fixed-term contract, business sector* (Ghignoni & Verashchagina, 2014)
- Detrimental effects at both the micro and macro levels:
 - lower wages (Verdugo & Verdugo, 1989);
 - lower satisfaction at work (Tsang *et al.*, 1991);
 - higher turnover rates (Sloane *et al.*, 1999);
 - global productivity losses (McGowan & Andrews, 2017).

Overeducation: where does it come from?

- First plausible explanation: large increase in educational attainment that the labour market cannot absorb (Groot & Maassen van den Brink, 2000)
 - *The share of 25-34 y.o. Europeans with a tertiary degree increased from 21% in 1999 to 45% in 2020.*

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- ⇒ Further research needed to investigate the drivers of overeducation

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⇒ **Which role of local labour market geography in explaining overeducation?**

Overeducation and geography - Individual level

- If an individual do not find a suitable job on the local labour market, he/she has three options (Simpson, 1992):
 - ① stay unemployed;
 - ② accept a job for which he/she is overeducated;
 - ③ search for a job located farther away.
- Individuals (especially the youngest ones) “flee” less dynamic labour markets (Langella & Manning, 2022).
- Individual spatial mobility helps reducing overeducation (Büchel & van Ham, 2003; Hensen *et al.*, 2009), but strong disparities between regions (Devillanova, 2013) and depending on the distance of migration (Jauhiainen, 2011).

Overeducation and geography - Labour market level

- Influence of the size of the labour market (Büchel & van Ham, 2003)
- Influence of local economic dynamism (Tselios, 2013)
- Influence of the local demography of firms (Ghignoni & Verashchagina, 2014)
- Influence of local unemployment (Büchel & van Ham, 2003)

- *At the inter-national level:*
 - *Impact of EPL (Di Pietro, 2002)*
 - *Impact of unionisation (Davia et al., 2017)*

Objectives

- **How does the local labour market context impacts overeducation?**
- **To what extent local labour market situation influences overeducation on neighbouring markets?**
- **Is there disparities between demographic groups in the effect of labour market geography?**

Data

- Census data: *Professional activity* database
 - Around 7.5 millions workers for each year
 - Overeducation rates
 - Local demographic (*young workers, commuters*) and labour market (*employment by sector, temporary contracts, supply-demand balance for skilled workers*) indicators
- Municipality-level census data to compute local unemployment rates
- Demography of firms data for firms creations and size

- Years 2009, 2013 and 2017 for overeducation rates; 2008, 2012 and 2016 for explanatory variables (time-lagged to avoid simultaneity)
- Indicators computed at the employment area level

Overeducation rates

An individual is overeducated if she or he has a tertiary degree but works in an occupation which do not require one.

- Based on the *Professional families* French classification
- Similar to more precise measures (calculated only for the years for which data is available)

Table: Overeducation rates

Variables	2009		2013		2017	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Overeducation rate	0.083	0.016	0.099	0.017	0.115	0.018
Female overeducation rate	0.099	0.019	0.114	0.020	0.132	0.022
Male overeducation rate	0.069	0.014	0.079	0.015	0.092	0.016
Youth overeducation rate	0.143	0.025	0.152	0.025	0.162	0.026
Observations	297		297		297	

French employment areas

- Defined by Insee, based on commuting flows, 304 areas
- “Most workers both live and work in the same area.”
- “Firms can find most of their workforce where they are based.”

Figure: French employment areas - 2010 zoning



Why spatial econometrics?

- Unemployment and overeducation related at the macro-level (Büchel & van Ham, 2003)
 - Strong spatial dependence between local unemployment rates (Patacchini & Zenou, 2007)
 - Trade-off between unemployment and overeducation at the individual level (Baert *et al.*, 2013; Meroni & Vera-Toscano, 2017)
- Local labour market shocks spread in neighbouring areas (Manning & Petrongolo, 2017)
- Competition between regions to attract highly educated workers (Rodríguez-Pose & Vilalta-Bufí, 2005)

- If observations are not independent, ignoring the spatial structure of the data will lead to biased estimators (Cliff & Ord, 1973, 1981).

Overeducation rates by employment area

Figure: Overeducation rates - 2009

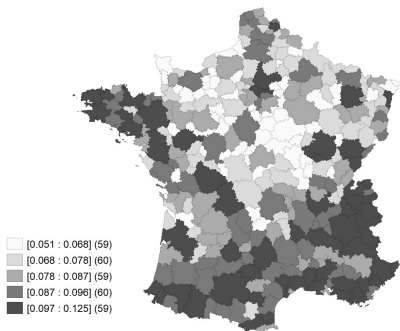
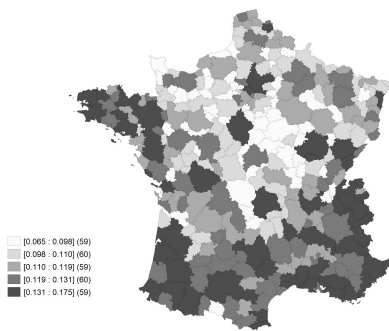


Figure: Overeducation rates - 2017



Spatial autocorrelation of overeducation rates

- Significant (positive) spatial autocorrelation: observations are not independent, with very similar rates in neighbouring areas.

Table: Spatial autocorrelation of overeducation rates (Moran's I)

Spatial weight matrix	2009		2017	
	Moran's I	p-value	Moran's I	p-value
First-order contiguity	0.426***	0.002	0.383***	0.002
Second-order contiguity	0.340***	0.002	0.317***	0.002
3 nearest neighbours (3NN)	0.468***	0.002	0.435***	0.002
4 nearest neighbours (4NN)	0.452***	0.002	0.411***	0.002
5 nearest neighbours (5NN)	0.443***	0.002	0.408***	0.002
6 nearest neighbours (6NN)	0.426***	0.002	0.407***	0.002
7 nearest neighbours (7NN)	0.421***	0.002	0.403***	0.002
Inverse distance (max 100km)	0.380***	0.002	0.357***	0.003
Number of observations	297		297	

*** indicates significance at the 1% level, ** at the 5% level and * at the 10% level.

Source : Author's calculation based on French population census and REE

Spatial models

- Spatial Durbin model (static SDM)
 - WY : influence of overeducation itself on neighbouring areas
 - WX : influence of the independent variables (labour markets indicators) on neighbouring areas

$$Y_t = \rho WY_t + X_t\beta + WX_t\theta + \alpha + u_t$$

- Dynamic Spatial Durbin model (DSDM)
 - Adds time lags of Y

$$Y_t = \tau Y_{t-1} + \rho WY_t + \eta WY_{t-1} + X_t\beta + WX_t\theta + \alpha + u_t$$

- ⇒ Direct and indirect effects (spatial dimension, SDM and DSDM)
- ⇒ Short term and long term effects (time dimension, DSDM only)

Spatial heterogeneity

- Educational attainment disparities between urban and rural areas (Rodríguez-Pose & Tselios, 2011)
 - Overeducation arises in narrower labour markets (Büchel & van Ham, 2003).
- ⇒ Spatial heterogeneity must be taken into account → spatial regimes models (Le Gallo, 2004)

- Spatial regimes DSDM model

$$Y_t = \tau Y_{t-1} + \rho WY_t + \eta WY_{t-1} + D_U X_t \beta_U + W D_U X_t \theta_U + D_R X_t \beta_R + W D_R X_t \theta_R + \alpha + u_t$$

D_U is equal to 1 if urban area (0 otherwise), D_R is equal to 1 if rural area (0 otherwise).

- ⇒ Heterogeneous effects between urban and rural areas

Empirical strategy

- Whole sample estimations
- Subsamples estimations
 - Women
 - Men
 - 25-34 year-olds
- Spatial regimes model for heterogeneous effects between urban and rural areas
- Panel model with area fixed effects
- Estimated using first-order contiguity matrix (but results are robust to other specifications of the spatial weights)

Results - Lagged dependent variables

- No significant effect of the spatially lagged dependent variables
 - Overeducation in one area do not directly influence overeducation in neighbouring areas in the short term (but neighbouring labour markets still have an effect through the explanatory variables).
- Positive effect of the time lagged dependent variable only for young workers
 - When they enter labour markets where overeducation is already high, they are more likely to become overeducated than older workers.
- Strong positive effect of the space-time lagged dependent variable for most estimations
 - Overeducation is higher in a given area if there was more overeducation in the neighbouring areas in the previous period.
 - Workers tried to “escape” overeducation by moving to the neighbouring areas, but finally ended up overcrowding those areas?

Whole sample - DSDM estimations

Table: Direct, indirect and total effects - Whole sample

	Variables	Direct	Indirect	Total
Short term	% of 25-34 year-olds in the labour force	0.004	0.177***	0.180***
	% of workers living outside their area of work	-0.005	0.142***	0.137**
	Number of microfirms per 100000 inhabitants (log)	0.021***	0.000	0.021***
	Number of newly established firms per 100000 inhabitants (log)	-0.010***	-0.011*	-0.021***
	% of employment in the agricultural sector	-0.040	-0.017	-0.056
	% of employment in the industrial sector	0.007	-0.096	-0.089
	% of employment in the construction sector	-0.062	-0.176	-0.238**
	% of employment in the sales sector	-0.008	-0.128*	-0.136*
	% of employment in the education, health and public sector	-0.125***	0.082	-0.043
	Excess supply of tertiary graduates	0.108***	-0.063***	0.045**
	% of temporary contracts	0.028	-0.182***	-0.154**
	Unemployment rate	-0.054	0.154*	0.100
Long term	% of 25-34 year-olds in the labour force	0.016	0.251***	0.268***
	% of workers living outside their area of work	0.006	0.198***	0.203**
	Number of microfirms per 100000 inhabitants (log)	0.020***	0.010	0.031***
	Number of newly established firms per 100000 inhabitants (log)	-0.011***	-0.020***	-0.031***
	% of employment in the agricultural sector	-0.041	-0.043	-0.083
	% of employment in the industrial sector	-0.000	-0.132	-0.132
	% of employment in the construction sector	-0.074	-0.279*	-0.353*
	% of employment in the sales sector	-0.017	-0.184*	-0.201*
	% of employment in the education, health and public sector	-0.118***	0.055	-0.063
	Excess supply of tertiary graduates	0.102***	-0.036	0.066**
	% of temporary contracts	0.014	-0.243***	-0.229***
	Unemployment rate	-0.042	0.190	0.148

*** indicates significance at the 1% level, ** at the 5% level and * at the 10% level.

Source : Author's calculation based on French population census and REE

Female sample - DSDM estimations

Table: Direct, indirect and total effects - Female sample

	Variables	Direct	Indirect	Total
Short term	% of 25-34 year-olds in the labour force	0.045	0.240***	0.286***
	% of workers living outside their area of work	0.101***	0.260***	0.360***
	Number of microfirms per 100000 inhabitants (log)	0.034***	0.001	0.035***
	Number of newly established firms per 100000 inhabitants (log)	-0.010***	-0.014*	-0.024***
	% of employment in the agricultural sector	-0.099	-0.088	-0.187
	% of employment in the industrial sector	0.090*	-0.093	-0.003
	% of employment in the construction sector	0.063	-0.339**	-0.276
	% of employment in the sales sector	0.033	-0.401***	-0.368***
	% of employment in the education, health and public sector	-0.154***	0.146*	-0.008
	Excess supply of tertiary graduates	0.111***	-0.111***	0.000
	% of temporary contracts	0.048	-0.327***	-0.279***
	Unemployment rate	0.017	0.136	0.153
Long term	% of 25-34 year-olds in the labour force	0.057	0.321***	0.378***
	% of workers living outside their area of work	0.113***	0.364***	0.477***
	Number of microfirms per 100000 inhabitants (log)	0.033**	0.013	0.046***
	Number of newly established firms per 100000 inhabitants (log)	-0.010***	-0.022**	-0.032***
	% of employment in the agricultural sector	-0.101	-0.145	-0.247
	% of employment in the industrial sector	0.083*	-0.087	-0.004
	% of employment in the construction sector	0.043	-0.409*	-0.366
	% of employment in the sales sector	0.011	-0.498***	-0.487***
	% of employment in the education, health and public sector	-0.143***	0.133	-0.010
	Excess supply of tertiary graduates	0.103***	-0.103***	0.000
	% of temporary contracts	0.029	-0.399***	0.370***
	Unemployment rate	0.024	0.178	0.203

*** indicates significance at the 1% level, ** at the 5% level and * at the 10% level.

Source : Author's calculation based on French population census and REE

Male sample - DSDM estimations

Table: Direct, indirect and total effects - Male sample

	Variables	Direct	Indirect	Total
Short term	% of 25-34 year-olds in the labour force	-0.110***	0.181**	0.071
	% of workers living outside their area of work	-0.099***	-0.045	-0.144*
	Number of microfirms per 100000 inhabitants (log)	0.005	0.004	0.008
	Number of newly established firms per 100000 inhabitants (log)	-0.011***	-0.012	-0.022***
	% of employment in the agricultural sector	-0.006	-0.270*	-0.276*
	% of employment in the industrial sector	-0.067	-0.272***	-0.338***
	% of employment in the construction sector	-0.192***	-0.165	-0.357**
	% of employment in the sales sector	-0.048	0.034	-0.014
	% of employment in the education, health and public sector	-0.121***	-0.036	-0.014
	Excess supply of tertiary graduates	0.086***	0.020	0.107***
	% of temporary contracts	-0.017	-0.077	-0.095
Unemployment rate	-0.199***	0.101	-0.098	
Long term	% of 25-34 year-olds in the labour force	-0.141***	0.245**	0.103
	% of workers living outside their area of work	-0.133***	-0.078	-0.210*
	Number of microfirms per 100000 inhabitants (log)	0.006	0.006	0.012
	Number of newly established firms per 100000 inhabitants (log)	-0.014***	-0.018*	-0.032***
	% of employment in the agricultural sector	-0.013	-0.388*	-0.401*
	% of employment in the industrial sector	-0.094	-0.398***	-0.492***
	% of employment in the construction sector	-0.258***	-0.262	-0.520**
	% of employment in the sales sector	-0.063	0.043	-0.020
	% of employment in the education, health and public sector	-0.160***	-0.068	-0.228**
	Excess supply of tertiary graduates	0.114***	0.040	0.155***
	% of temporary contracts	-0.025	-0.114	-0.139
Unemployment rate	-0.261***	0.118	-0.143	

*** indicates significance at the 1% level, ** at the 5% level and * at the 10% level.

Source : Author's calculation based on French population census and REE

Youth sample - DSDM estimations

Table: Direct, indirect and total effects - Youth sample

	Variables	Direct	Indirect	Total
Short term	% of 25-34 year-olds in the labour force	-0.111*	0.200	0.089
	% of workers living outside their area of work	0.030	0.200	0.230*
	Number of microfirms per 100000 inhabitants (log)	0.035**	-0.024	0.012
	Number of newly established firms per 100000 inhabitants (log)	-0.012*	0.025*	0.013
	% of employment in the agricultural sector	-0.194	0.237	0.043
	% of employment in the industrial sector	0.145	-0.353**	-0.209
	% of employment in the construction sector	0.000	-0.392	-0.391
	% of employment in the sales sector	0.089	-0.173	-0.085
	% of employment in the education, health and public sector	-0.091	0.129	0.038
	Excess supply of tertiary graduates	0.134***	-0.066	0.067
	% of temporary contracts	-0.141**	-0.239	-0.381**
	Unemployment rate	-0.125	-0.027	-0.152
Long term	% of 25-34 year-olds in the labour force	-0.141	0.258	0.118
	% of workers living outside their area of work	0.039	0.263	0.302*
	Number of microfirms per 100000 inhabitants (log)	0.045**	-0.030	0.015
	Number of newly established firms per 100000 inhabitants (log)	-0.016*	0.033*	0.017
	% of employment in the agricultural sector	-0.246	0.304	0.058
	% of employment in the industrial sector	0.183	-0.457*	-0.274
	% of employment in the construction sector	-0.002	-0.513	-0.515
	% of employment in the sales sector	0.112	-0.223	-0.111
	% of employment in the education, health and public sector	-0.116	0.166	0.050
	Excess supply of tertiary graduates	0.171***	-0.082	0.089
	% of temporary contracts	-0.183**	-0.318	-0.501**
	Unemployment rate	-0.161	-0.039	-0.200

*** indicates significance at the 1% level, ** at the 5% level and * at the 10% level.

Source : Author's calculation based on French population census and REE

Whole sample - Spatial regimes estimations

Table: Direct, indirect and total effects for spatial regimes DSDM

Variables	Short-term effects			Long-term effects		
	Direct	Indirect	Total	Direct	Indirect	Total
Urban areas						
% of 25-34 year-olds in the labour force	0.151***	0.076	0.227*	0.162***	0.262	0.424*
% of workers living outside their area of work	0.003	-0.213*	-0.210*	-0.022	-0.373*	-0.395*
Microfirms per 100000 inhabitants (log)	0.027***	0.006	0.033***	0.028***	0.034*	0.062***
New firms per 100000 inhabitants (log)	-0.023***	-0.052***	-0.075***	-0.029***	-0.112***	-0.141***
% of employment in the agricultural sector	-0.146	0.491*	0.345	-0.090	0.744	0.653
% of employment in the industrial sector	-0.038	-0.239*	-0.276*	-0.066	-0.454*	-0.520*
% of employment in the construction sector	0.241**	0.093	0.333	0.255**	0.373	0.628
% of employment in the sales sector	0.229***	-0.002	0.226	0.232***	0.195	0.427
% of employment in the care and public sector	-0.005	0.075	0.070	0.003	0.129	0.133
Excess supply of tertiary graduates	0.119***	-0.190***	-0.072*	0.098***	-0.234***	-0.136
% of temporary contracts	-0.005	0.020	0.015	-0.003	0.031	0.028
Unemployment rate	-0.180***	0.282*	0.102	-0.149**	0.342	0.193
Rural areas						
% of 25-34 year-olds in the labour force	-0.018	0.263***	0.245***	0.012	0.448***	0.460***
% of workers living outside their area of work	-0.009	0.211***	0.202***	0.016	0.364***	0.380***
Microfirms per 100000 inhabitants (log)	0.023***	-0.007	0.016*	0.023***	0.007	0.030*
New firms per 100000 inhabitants (log)	-0.008***	0.002	-0.006	-0.008***	-0.003	-0.010
% of employment in the agricultural sector	-0.084*	-0.042	-0.126	-0.090*	-0.147	-0.237
% of employment in the industrial sector	-0.017	-0.072	-0.090	-0.026	-0.143	-0.167
% of employment in the construction sector	-0.103*	-0.292**	-0.394***	-0.139**	-0.603**	-0.741**
% of employment in the sales sector	-0.096**	-0.120	-0.216***	-0.111***	-0.293**	-0.404***
% of employment in the care and public sector	-0.185***	-0.012	-0.197**	-0.189***	-0.181	-0.370**
Excess supply of tertiary graduates	0.111***	-0.051**	0.061***	0.107***	0.006	0.113***
% of temporary contracts	0.017	-0.207***	-0.190***	-0.007	-0.350***	-0.357***
Unemployment rate	-0.008	0.155	0.148	0.011	0.267	0.278

*** indicates significance at the 1% level, ** at the 5% level and * at the 10% level.

Source : Author's calculation based on French population census and REE

Conclusion

- Significant effects of the local economic context
- Significant effects of the situation on neighbouring labour markets
 - Limited effects on younger workers (because they are more mobile?)
- Women seem to be more at risk of being “pushed down” into lower skilled jobs in areas with more competition.
- More indirect effects in rural areas than in urban areas
- Differentiated effects between rural and urban areas
 - Related to opportunities in rural areas
 - Related to competition in urban areas

Thank you for your attention