

Agglomeration externalities and offer of firm sponsored training : evidence from France.

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Offer of firm sponsored training

Training by firms

- Firm sponsored training : the firm pays to train its workers.
- Firms from private sector.
- Training studies : individual access to training or total offer of training by firms.

Agglomeration and training

- Local market conditions affects firms decision.
- What is the effect of agglomeration on its offer of training ?

The effects of agglomeration on training

Previous studies

- Agglomeration (with employment density as a proxy) has a negative impact on access to training.
- This effect is interpreted as poaching effects prevailing over pooling effects.

The goal of our study

- We suggest another interpretation for agglomeration externalities in the case of training.
- Our methodology allow us to determine that poaching effects doesn't seems to impact training like it was previously claimed.
- Our identification strategy allow us to more precisely assess the impact of agglomeration externalities on training offer.

Training and agglomeration in previous studies

- Brunello and Gambarotto (2007) : negative impact of employment density on access to training.
 - They Intepret this effect using Combes and Duranton (2006) : poaching effects prevails over pooling effects in the case of training.
 - They show that trained workers were more subject to poaching.
 - Other papers on training and agglomeration followed there interpretation.
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- Problem : even if poaching effects are here, what is the effect of other agglomeration economies?

Agglomeration economies

- Détang-Dessendre (2010) suggests to be careful when interpreting agglomeration effects only as a pooling vs poaching mechanism.
- Other studies about agglomeration externalities : interpret employment density as a proxy for all agglomeration economies, not only a pooling vs poaching.

Measuring offer of training by firms

- Previous studies measured training as the percent of workers trained or the probability for a worker to be trained.
- This is not a good measure of training : we need both the number of people trained and the duration of those trainings.
- Rzepka and Tamm (2016) : firm concentration in a sector reduce probability to access training, but also raises the duration of trainings.

Why a negative impact of agglomeration on training?

- Matching effects are part of pooling effects : while being an agglomeration economy, it can negatively impact the number of people receiving training.
- More agglomerated area = more dense local labour market.
⇒ It is easier for firm to find workers with the right skills, thus decreasing the number of workers trained.
- This would explain why Rzepka and Tamm (2016) found positive effect of firm concentration on training duration. Skills that firms can't find on labour market are more specific, hence the need for longer trainings.

If matching is responsible for the effect of agglomeration economies on training, what does it imply for our estimates depending on our different measures of training?

- Percent of workers trained : like in previous studies, negative effect of agglomeration because firms are more likely to find the right skills in local labour market.
- Average duration of training for trained workers : Workers being trained should have longer trainings, because skills needed by firms are more rare/specific.
- Average duration of training : this variable will allow us to see the effect of agglomeration on training. It's the more "objective" way to measure training offered by a firm.

We need to be sure poaching effects are not responsible for the negative effect of agglomeration on training : how to control for poaching effects ?

- In the case of training, poaching effects are, according to previous studies, caused by trained workers being hired by competition.
- We need a way to measure how poaching is affecting offer of firm sponsored training.
- For each firm we compute the turnover of workers :

$$TO_{i,t} = \frac{\text{Number of workers in } t-1 \text{ who are no more in a firm } i \text{ in } t}{\text{Number of workers in a firm } i \text{ in } t}$$

Model

We would like to estimate this model for our 3 measure of training.

$$y_{i,t} = \alpha_i + \theta_t + \gamma_{ind} + X_{i,t}\beta + \delta ED_{L,t} + \varepsilon_i$$

where $y_{i,t}$ is one of our training measures, α_i is a firm fixed effect, γ_{ind} is an industry fixed effect, θ_t is a time fixed effect, $X_{i,t}$ a set of variables representing firm characteristics, and $ED_{L,t}$ is the log of employment density in a local labour market L .

Problem : all firms are not training their workers, some decide to train, other don't. This need to be accounted for in the model \Rightarrow type 2 tobit model.

$$\begin{cases} y_{1,i,t}^* > 0 & \text{If the firm decides to train} \\ y_{1,i,t}^* \leq 0 & \text{If the firm decides to not train} \end{cases}$$

$$y_{2,i,t} = \begin{cases} y_{1,i,t}^* > 0 & \text{si } y_{1,i,t}^* > 0 \\ 0 & \text{si } y_{1,i,t}^* \leq 0 \end{cases}$$

- Issue with Tobit model : cannot use firm fixed effects (no estimation method available) who are use to control for firm sorting in agglomerated area and firm training habits.
- We choose to estimate 2 different model : a linear version of the model presented previously, and a tobit model without firm fixed effects.
- Our aim is too see if both model lead us to the same conclusion.
- As we're loosing some control with the absence of firm fixed effects in the tobit model, we also control for workforce composition by adding the percent of different occupational category of the workforce (farmers, craftsmen, executives, white collars, middle-level profession, blue collars).

French data : a perfect match for this study

Annual Social Data Declarations database :

- Data for every employee in France (outside of government employees).
- Each observation (or post), for a given year, represents an employee working in a particular establishment.
- Informations about the worker and the firm he works in.
- We also know about workers being here the previous year but not in the current one (allow us to compute turnover).

⇒ We aggregate those data at the establishment level.

24-83 declarations :

- Each firm with more than 10 employees have to invest a part of its payroll into training (or they can pay a tax instead). Training by those firms is reported in this database.
- We can compute our 3 measures of training : percent of workers trained, hours of training for trained workers, and average training for all workers.

Merging data :

- 24-83 data are at the firm level, but firms can have multiple establishments, we need to locate the firm to include local labour market characteristics, thus we only keep single establishment firms.
- Data are merged by SIREN (unique ID for all french firms).
- We also merge data about population density from the French National Institute for Statistics at the employment zone (a zone where most workers lives and works).

Results : Percent of workers trained

	<i>Percent of workers trained</i>	
	Type 2 Tobit	Linear
Intercept	0.391*** (0.051)	/
Turnover	-0.0001 (0.0003)	0.0002 (0.0002)
Log employment density	-0.0023*** (0.0004)	-0.005* (0.0028)
Average age	-0.00007 (0.0001)	-0.0015*** (0.0002)
% Not in full time	-0.076*** (0.003)	-0.007 (0.005)
Industry Fixed Effects	Yes	Yes
Time Fixed Effects	Yes	Yes
Workforce Composition	Yes	No
Individual Fixed Effects	No	Yes
Observations	337502	386580

Note :

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Results : Average hours of training for trained workers

	<i>Average hours of training for trained workers</i>	
	Type 2 Tobit	Linear
Intercept	30.25*** (8.769)	/
Turnover	0.050 (0.063)	-0.007 (0.040)
Log employment density	0.064 (0.071)	0.321 (0.532)
Average age	-0.389*** (0.024)	-0.274*** (0.041)
% Not in full time	-1.554** (0.635)	-2.257* (0.970)
Industry Fixed Effects	Yes	Yes
Time Fixed Effects	Yes	Yes
Workforce Composition	Yes	No
Individual Fixed Effects	No	Yes
Observations	337502	386580

Note :

* p<0.1 ; ** p<0.05 ; *** p<0.01

Results : Average hours of training

	<i>Average hours of training</i>	
	Type 2 Tobit	Linear
Intercept	8.537*** (2.347)	/
Turnover	0.004 (0.017)	0.008 (0.010)
Log employment density	-0.165*** (0.015)	-0.059 (0.134)
Average age	-0.090*** (0.006)	-0.091*** (0.010)
% Not in full time	-2.249*** (0.171)	-0.428* (0.244)
Industry Fixed Effects	Yes	Yes
Time Fixed Effects	Yes	Yes
Workforce Composition	Yes	No
Individual Fixed Effects	No	Yes
Observations	337502	386580

Note :

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Conclusion : further work

Our estimates confirms that poaching effects does not seems to have effect on the offer of firm sponsored training.

Further work will try to understand if the non significant impact of employment density on training measured by hours (by workers and trained workers) is due to a lack of effect, or a lack of control of other mechanisms at the local labour market level.

- Robustness check (instrument density with geology and long lagged population census data).
- Add variables to control for more local labour market characteristics (diversity, potential etc...).
- Add turnover of workers at the local labour market level.

Thank you for your attention.

