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DISCUSSION PAPER SERIES

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DECEMBER 2021

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ABSTRACT

Labor Market Concentration and Stayers' Wages: Evidence from France*

We investigate the impact of labor market concentration on stayers' wages, where stayers are defined as individuals who were already employed in the same firm the year before. Using administrative data for France, we show that the elasticity of stayers' wages to labor market concentration ranges between -0.0185 and -0.0230, depending on the instrument we use, and controlling for labor productivity and local product market concentration. This represents between about two thirds and three fourth of the elasticity we estimate for new hires. Given the strong wage rigidities characterizing the French labor market, this estimate can be considered a lower bound of the effect of labor market concentration on stayers' wages in an international perspective.

JEL Classification: J31, J42, L41

Keywords: labor market concentration, monopsony, wages, stayers

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1 Introduction

How labor market concentration affects wages has been the subject of a burgeoning literature in recent years. Many papers have shown that a substantial proportion of individuals are employed in labor markets that are at least moderately concentrated according to the thresholds defined by the US Horizontal Merger Guidelines and that this has a depressing effect on average wages, consistent with a monopsony model (Azar et al., 2020b; Rinz, 2020; Benmelech et al., 2020; Martins, 2018; Hafner, 2021; Schubert et al., 2021). Beyond average wages, there is evidence that concentration affects posted wages for new vacancies (Azar et al., 2020a) and actual wages of new hires (Marinescu et al., 2021).

In this paper we investigate the impact of labor market concentration on stayers' wages, where stayers are defined as incumbents, i.e. individuals who were already employed in one of the establishments of their current firm the year before. Looking at stayers is important since they represent a large share of all employees in any given year in all OECD countries (OECD, 2010). This is particularly the case in our data where they represent 73% of all observations. Stayers' wages have also been shown to be the largest contributor to aggregate wage growth, at least in recent years (Hahn et al., 2017, 2021). However, so far, no systematic evidence has been provided on how labor market concentration affects them. Aggregate effects found in the literature could in principle be driven by new hires only or by both new hires and stayers. In the former case though, this would imply that labor market concentration only affects wages at the margin, i.e. for individuals who change jobs.

In the present paper, we use French data to estimate the elasticity of stayers' wages with respect to labor market concentration. In doing so, it is crucial to properly control for establishment-level productivity and product market concentration since these are major confounding factors. Most papers in the literature do not. Two noticeable exceptions are Benmelech et al. (2020) and Marinescu et al. (2021). To dispose of data on establishment-level labor productivity, the former restrict their analysis to the manufacturing sector. To the extent that they focus on tradable goods, they validly control for product market concentration by including firm-by-time fixed effects. Marinescu et al. (2021) consider all sectors of the economy but by controlling for full-time equivalent employment and value-added per worker at the firm level, they do not take into account differences in productivity that may correlate with labor market concentration and wages at the more disaggregate (establishment) level where wages are observed. In this paper, we control for establishment-level productivity and product market concentration in the strictest possible way, i.e. by including establishment-by-time fixed effects.

An additional concern when estimating the impact of labor market concentration on stayers' wages is that changes in the composition of the workforce and/or

assortative matching between workers and firms could act as confounders. [Qiu and Sojourner \(2019\)](#) indeed find that labor market concentration tends to reduce the average level of education of employees, so that part of the decrease in wages associated with higher concentration could be due to a reduction in the quality of the workforce. Moreover, [Macaluso et al. \(2019\)](#) show that the greater the labor market concentration, the higher the skill requirements imposed by firms, conditional on workers' education. This suggests that firms in concentrated labor markets are more selective in choosing workers who best fit their specific needs. To make sure that our results are not driven by any composition and/or sorting effect, we control for match-specific heterogeneity in one of our specifications. To our knowledge, we are the first to do so in the literature.

We find that the elasticity of stayers' wages to labor market concentration ranges from -0.0185 to -0.0230 depending on the instrument we use, i.e. between about two thirds and three quarters of the elasticity we estimate on new hires. France is particularly interesting in this respect since it is characterized by strong wage rigidities ([Le Bihan et al., 2012](#); [Avouyi-Dovi et al., 2013](#); [Fougère et al., 2018](#)). As a consequence, the impact of labor market concentration on stayers is likely to be smaller than in other countries and hence could be considered a lower bound from an international perspective. Nonetheless, the elasticity we find points to a significant degree of employers' monopsony power, on average. It may also suggest that firms in concentrated labor markets are able to advantageously renegotiate (and/or unilaterally adjust) wages of stayers who face few outside options.

To our knowledge, only two other papers estimate the impact of labor market concentration on stayers' wages. [Thoresson \(2021\)](#) studies the impact of a reform of the State monopoly over pharmacies in Sweden in 2009. Entry barriers were removed and a majority of state-owned pharmacies were privatized, thereby increasing the number of employers on the market for these industry-specific skills. As a consequence, wages in this sector increased with elasticities ranging between -0.02 and -0.05. Our paper enlarges the scope of the analysis by considering the impact of labor market concentration on stayers' wages in all sectors of the economy. [Arnold \(2021\)](#) shows that mergers and acquisitions that lead to higher concentration have a negative effect on the wages of employees who stay in the firms that have merged. We identify the effect of labor market concentration on non-merged companies¹ and show that when labor market concentration changes independently of changes in the firms boundaries due to mergers, stayers' wages fall. This suggests that employers may be able to take advantage of the reduction in outside options induced by greater concentration to reduce stayers' wages.

The remainder of the paper is structured as follows. [Section 2](#) lays out our

¹Our data do not allow following stayers over time in merged companies since merging firms change identifiers.

empirical strategy. Section 3 describes the data that we use and presents summary statistics. Section 4 presents the results and Section 5 concludes.

2 Empirical specification

2.1 Labor market concentration

In the literature, concentration is typically measured at the level of individual local labor markets. Part of this literature defines a local labor market as one single industry in a particular geographical area (most often commuting zones) - see [Rinz \(2020\)](#); [Benmelech et al. \(2020\)](#). However, the very existence of non-poaching agreements covering several occupations, e.g. in high-tech industries ([Gibson, 2021](#)), suggests that employees change jobs across industry borders when they are free to do so. Moreover, workers in different occupations within a given industry usually do not compete for the same jobs - see e.g. [Prager and Schmitt \(2021\)](#). To overcome this problem, we use a definition, frequently used in the literature, which characterizes a local labor market as one occupation in a given geographical area - see [Azar et al. \(2020a\)](#); [Martins \(2018\)](#); [Marinescu et al. \(2021\)](#).² This choice is also motivated by the fact that one of our contributions is to identify the effect of labor market concentration, controlling in the strictest possible way for plant productivity and local product market concentration. Given the structure of our data, we do so by introducing plant-by-time fixed effects in our specification - see Section 2.2. Since a given plant operates in one single industry and geographical area, these would be collinear to any measure of labor market concentration defined with respect to an industry in a geographical area. This is also why we choose to define local labor markets on the basis of occupations in commuting zones.

Based on this definition, we measure employer concentration using the Herfindhal-Hirschman Index (HHI) computed either on hirings or on employment:

$$HHI_{l,t} = \sum_{f=1}^{N_{l,t}} s_{f,l,t}^2 \quad (1)$$

where $HHI_{l,t}$ is the HHI for local labor market l at year t where l is defined as $l = (o, z)$, i.e 4-digit occupation o in commuting zone z . $N_{l,t}$ is the number of firms that have positive hirings (resp. employment) in local labor market l at time t and $s_{f,l,t}$ is the share of firm f in hirings (resp. employment) in local labor market l at

²[Dodini et al. \(2020\)](#) suggest using a skill-based definition of labor markets. However, since changes in occupations generally entail wage penalties - [Gathmann and Schönberg \(2010\)](#); [Kambourov and Manovskii \(2009\)](#) -, the extent to which skills are truly homogeneous within skill groups is critical to this approach. [Dodini et al. \(2020\)](#) conduct a cluster analysis with a fixed small number of skill groups (20) but it is still unclear whether these groups are homogeneous enough for occupations to be almost perfect substitutes within each group.

time t . With this definition, HHI ranges from 0 (no concentration) to 1 (one firm in the market).

In our baseline specification, we use an HHI based on hirings although we also present a robustness check showing that our results are unchanged if using an HHI based on employment. In a standard Cournot model of oligopsony, wages are indeed inversely related to the HHI measured in terms of employment (Boal and Ransom, 1997). An HHI based on employment also seems to be a reasonable approximation of the index of labor market concentration that is relevant for wage determination in a stationary search and matching model with granular search, where concentration affects wages by changing workers' outside options (Jarosch et al., 2021). However, in a non-stationary environment, downsizing firms may have a positive share of the stock of employment in a local labor market, whereas their hirings are zero, so that they do not contribute to creating outside options for workers in that labor market. In this case, as emphasized by Marinescu et al. (2021), a measure based on hirings better captures the fact that labor market concentration may negatively affect wages by reducing workers' outside options.

2.2 Labor market concentration and wages

We estimate the impact of labor market concentration on individual wages. Our baseline specification is as follows:

$$\log(w_{i,j,f,l,t}) = \beta \log(HHI_{l,t}) + \mathbf{X}_{i,j,f,l,t} \gamma + \mu_i + \mu_l + \mu_{j,t} + \epsilon_{i,j,f,l,t} \quad (2)$$

where i indices the individual, j the establishment and f the firm. w denotes the individual wage. \mathbf{X} is a vector of time-varying individual controls including individual age, whether or not the individual is a new hire and, if so, whether or not he/she was employed the year before. μ are fixed effects. Standard errors are clustered at the local-labor-market-by-time level, which is the level at which the HHI varies.

In this baseline specification, we control for individual and local-labor-market fixed effects. We also include establishment-by-time fixed effects. When estimating the impact of labor market concentration on wages, labor productivity and product market concentration are indeed key potential confounders. Including establishment-by-year fixed effects allows controlling for establishment-level labor productivity better than any measure of value added per worker that can only be computed at the firm level (since establishments are not profit centers in France). This also allows controlling for product market concentration. If local firms produce for the national or international market - and not only for the local market -, product market concentration is firm specific and firm-by-year fixed effects would control for it. However, if establishments in a given geographical area produce for

the local market, a simple way to control for product market concentration would be to include firm-by-commuting-zone-by-year fixed effects. Since establishments of a given firm do not change location, controlling for establishment-by-year fixed effects does the same job.

A key threat to identification in this set-up is that an omitted time-varying variable could be correlated with both the HHI and wages. This is the case, for example, if a negative shock on the supply of labor takes place in a local labor market $l = (o, z)$. This shock is likely to raise wages. If productivity stays unchanged, unit labor costs go up thereby likely reducing the number of local firms which find it profitable to employ this type of labor. As a consequence, labor market concentration would increase thus giving rise to a positive correlation between the HHI and wages that would, in fact, be due to reverse causality. By contrast, a positive shock to the infrastructure of a local labor market will likely increase labor demand and hence wages, while making it profitable for a larger number of firms to operate on this market. This will, in turn, reduce labor market concentration, thereby biasing our estimates towards more negative values.

To deal with this endogeneity problem, we rely on an instrumental variable strategy building upon [Azar et al. \(2020a\)](#), [Rinz \(2020\)](#) and [Marinescu et al. \(2021\)](#). These scholars suggest instrumenting $\log(HHI)$ in local labor market $l = (o, z)$ at time t with the average of $\log(1/N_{o,z',t})$ in all other commuting zones z' for the same occupation o and time period - where $N_{o,z',t}$ is the number of firms with positive hirings (resp. employment). $1/N_{o,z',t}$ corresponds to the value of the HHI in local labor market $l' = (o, z')$ when all firms have the same hirings (resp. employment) share in that market. This instrument provides a source of variation of labor market concentration relying on national rather than local changes in the occupation we consider.³

One limitation of this instrument is that it gives equal weight to all local labor markets independent of their size. To avoid that the value of our instrument be partly determined by changes in very small markets, we also use a weighted version of it. Specifically, we instrument the HHI in a local labor market with the weighted average of $\log(1/N_{o,z',t})$ in all other commuting zones z' for the same occupation and time period, where the weights are the shares of each local labor market in all new hires (resp. employment) in France in the corresponding occupation.

3 Data

We use two datasets extracted from the French Social Security records (DADS). The first one (DADS-Postes) covers the universe of salaried workers and establishments

³This type of leave-one-out instrument is standard in international economics and industrial organization - see e.g. [Hausman et al. \(1994\)](#), [Autor et al. \(2013\)](#), [Bai et al. \(2017\)](#) and [Azar et al. \(2019a\)](#).

except part of agriculture and the public sector. This contains information on establishment location (municipality) and the firm to which the establishment belongs. Moreover, it provides information on gross annual wages, employment spells, hours worked and workers' age, gender and 4-digit occupation for all employees with non-zero hours worked in a given year. Establishments have a unique identifier which is invariant over time, except when the establishment changes location or is sold out to another company, in which case it is assigned a new identifier. By contrast, for the sake of anonymity, workers' identifiers are changed every year. However, for any given year, we know in which establishments employees were working the year before. We use data starting in 2009 since information on occupations was not systematically reported before that date. We match each municipality contained in the DADS-Postes with the 2010 commuting zones using a mapping provided by the French Statistical Institute (INSEE).

For the subset of workers in the DADS-Postes who were born in October of each year, there exists a panel which maintains the same identifier over time for each worker and hence allows following workers across various employers and years. This panel (DADS-Panel) is available only until 2017. Since some of our controls are lagged one year, our analysis covers the period ranging from 2010 to 2017.

We use the whole DADS-Postes to construct HHIs based on hirings (and employment). We eliminate internships as well as household workers and workers with fewer than 30 days of employment with the same employer in a year.⁴ We also eliminate the sub-sectors belonging to agriculture and the public sector. A new hire in a given year is defined as a worker who did not work for any establishment of the firm the year before. In contrast, a stayer is an incumbent worker, i.e. a worker who was already employed in one of the establishments of the firm the year before.

Descriptive statistics of concentration in French local labor markets are reported in Appendix Table A1. When measured with reference to hirings, mean concentration, weighted by employment, is relatively low over the period we consider (2010-2017): it is around 0.12, which is below the threshold for moderate concentration (0.15) defined by the US antitrust authorities. Unsurprisingly, it is lower when measured on the basis of employment: about 0.09. However, mean values of HHIs turn out to be much larger than median values, suggesting that a number of local labor markets are highly concentrated. Labor markets at the top of the distribution turn out to be highly concentrated: the 90th percentile is indeed well above the US threshold for high concentration (0.25) when measured on the basis of hirings (HHI = 0.32) and close to it when measured on the basis of employment (HHI = 0.24).

Between 2010 and 2017, although 78% of workers were employed in a market where HHI based on hirings was lower than 0.15 (resp. 83.6% for HHI based on employment), 13.1% (resp. 9.7%) were employed in local labor markets where HHI

⁴The so-called *emplois annexes*.

based on hirings (resp. employment) was higher than 0.25, which corresponds to high concentration - see Appendix Table A2. As evidenced in the table, these proportions are remarkably stable over time during the period under study.

In over 70% of French commuting zones, the average concentration between 2010 and 2017 was above 0.15, the threshold for moderate concentration - see Figure A1. As in most countries - see Abel et al. (2018), Rinz (2020) and Azar et al. (2019b) - local labor markets are more concentrated in mostly rural than in mostly urban commuting zones in France. This will be accounted for in our regressions by including local labor market fixed effects.

Our preferred specification has daily wages as the dependent variable. These are defined as the ratio of gross annual wages to the number of days in employment in a year. They represent a more accurate measure of labor earnings than hourly wages since a number of firms report conventional rather than actual hours worked in the DADS thus giving rise to much measurement error. In order to avoid that our results be affected by the incidence of very short part-time employment, we restrict our sample to full-time workers. Nonetheless, we run a robustness check including part-timers with hourly wages as the dependent variable. Whatever the wage variable we use, as standard when using the DADS, we trim the top and bottom 1% wages.

Our observations are individual-by-establishment-by-year triples. Descriptive statistics for our full sample are provided in Appendix Table A3. As shown in the first panel, stayers represent 73.2% of our sample while full-time workers are 72.7%. Stayers are on average older than new hires (40.2 as compared to 32.3) - see the second panel. Unsurprisingly, they earn higher daily wages (65.75€ as compared to 44.11€) and males represent a slightly larger proportion of them than in new hires (57.9% vs 56.8%). As evidenced in the third panel, a majority of new hires (69.7%) were in employment - although not with their current employer - the year before.

4 Results

We first estimate the impact of labor market concentration on daily wages of full-time workers. The results are shown in Table 1. As evidenced in Panel A, the OLS point estimates are negative although small in magnitude. Moreover, the association between labor market concentration and wages is significant at the 5% level when estimated for stayers only but it is insignificant at conventional levels when estimated on new hires. However, as mentioned in Section 2.2, the small effect of labor market concentration on wages could be due to reverse causality if local labor supply shocks simultaneously drive wages and the number of firms in the local labor market.

To tackle this endogeneity problem we run IV estimates in which $\text{Log}(HHI_{l,t})$ is instrumented by the (unweighted or weighted) average of $\log(1/N_{l,t})$, where $N_{l,t}$

is the number of firms with positive hirings in occupation o in all commuting zones z' except the one corresponding to labor market l . This instrument is strongly correlated with labor market concentration, as evidenced by the first-stage F-statistics reported at the bottom of Table 1. When estimated in this way, the impact of labor market concentration on daily wages turns out to be negative and significant at the 1% level, whatever the instrument and the sample we consider. Using the unweighted IV as in [Marinescu et al. \(2021\)](#), the point estimate we find for new hires is -0.0287. This is slightly more than one half of what they find with their specification including only individual fixed-effects (-0.0518). However, it is in the order of magnitude of the elasticity they uncover when including, as we do, both individual and firm fixed-effects⁵ (-0.0199).

As expected, the effect of labor market concentration on wages is smaller for stayers than for new hires, with an elasticity ranging from -0.0185 to -0.0230 depending on the instrument. When relying on the unweighted IV - Panel B -, we estimate that moving from the median to the 90th percentile of the concentration distribution generates a wage penalty of about 11% for stayers as compared to 17% for new hires. The gap across both groups is slightly smaller when using the weighted IV with a wage penalty of 13.6% for stayers as compared to 17.5% for new hires - Panel C. In both cases, however, the depressing effect of labor market concentration on stayers' wages is far from negligible: between about two thirds and three quarters of that estimated on new hires.

Since the impact of labor market concentration on daily wages can only be meaningfully estimated on full timers, we run a robustness check on the joint sample of full-time and part-time workers, using hourly wages as the dependent variable. The results are presented in Table 2. As evidenced in columns (2) and (3), the impact of labor market concentration on stayers' wages is negative and significant at the 1% level with an elasticity ranging from -0.0117 to -0.0126 depending on the instrument.⁶

To make sure that our results are not driven by any composition and/or sorting effect, we estimate an additional specification in which we control for match-specific heterogeneity. We do so by augmenting our baseline specification with a spell fixed effect (μ_S) where S denotes the spell of individual i in firm f .⁷ As evidenced in Table 3, the elasticity of stayers' wages with respect to labor market concentration remains stable, ranging from -0.0131 to -0.0180 depending on the instrument, and always significant at the 1% level.

Finally, we estimate the impact of labor market concentration on stayers' wages

⁵In our specifications, firm fixed effects do not appear directly since they are collinear with establishment-by-time fixed effects.

⁶The corresponding results for new hires are provided in Appendix Table A4.

⁷This specification cannot be estimated for new hires since only one observation per spell is available for them, by definition.

using a measure of the HHI based on employment rather than hirings. As shown in Table 4, the results are very similar to those obtained with the HHI based on hirings: the elasticity of stayers' wages with respect to labor market concentration varies between -0.0232 and -0.0282 according to the instrument we use, always significant at the 1% level.⁸

5 Conclusion

Using French administrative data, we have shown that the elasticity of stayers' wages to labor market concentration ranges between -0.0185 and 0.0230. This is far from negligible since this amounts to between two thirds and three fourth of the elasticity we estimate for new hires. Our estimates control for labor productivity and product market concentration in the strictest possible way, i.e. by including establishment-by-time fixed effects. Since wage rigidities are particularly strong in France, the effect on stayers' wages that we find could be considered as a lower bound from an international perspective.

Our results complement those of [Thoresson \(2021\)](#) who finds that reduced labor market concentration in pharmaceutical retailing led to an increase in wages for incumbent workers in Sweden. We show that labor market concentration is also harmful to stayers' wages in another EU country, France, and in the whole economy. Our findings also complement [Arnold \(2021\)](#) who finds that mergers that increase labor market concentration reduce stayers' wages in merged companies. We find that concentration affects stayers' wages in non-merged companies too.

Our findings also suggest a channel through which labor market concentration may reduce the labor share, as evidenced by [Jarosch et al. \(2021\)](#). To the extent that stayers' wages have been found to be a key determinant of the latter ([Hahn et al., 2021](#)), the negative effect of labor market concentration on stayers' wages that we find stands as a potential mechanism by which increasing concentration on the labor market may reduce the labor share. Symmetrically, our findings are consistent with the fact that the labor share remained quite stable in France in recent years - see [Cette et al. \(2020\)](#) - since labor market concentration did not markedly increase since 2010, as evidenced in Table A2.

⁸The corresponding results for new hires are provided in Appendix Table A5.

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Table 1: Daily Wages of Full-time Workers - HHI based on hirings

	Log(Daily Wage)		
	(1)	(2)	(3)
	All	Stayers	New hires
Panel A. OLS			
$\text{Log}(HHI_{l,t})$	-0.0005*	-0.0005**	-0.0014
	(0.0003)	(0.0003)	(0.0020)
Observations	9,205,538	7,034,688	2,170,850
R^2	0.91	0.93	0.89
Panel B. Unweighted IV			
$\text{Log}(HHI_{l,t})$	-0.0244***	-0.0185***	-0.0287***
	(0.0018)	(0.0016)	(0.0099)
Observations	9,205,504	7,034,661	2,170,843
Kleiberg-Papp F-stat	1,098.09	1,023.54	531.59
Panel C. Weighted IV			
$\text{Log}(HHI_{l,t})$	-0.0267***	-0.0230***	-0.0296***
	(0.0020)	(0.0019)	(0.0100)
Observations	9,205,504	7,034,661	2,170,843
Kleiberg-Papp F-stat	742.14	658.32	407.40
Individual FE	Yes	Yes	Yes
Age FE	Yes	Yes	Yes
Labor market FE	Yes	Yes	Yes
Establishment*Year FE	Yes	Yes	Yes
New hire dummy	Yes	-	-
Employed year before if new hire	Yes	-	Yes

Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Standard errors are clustered at the labor-market-by-time level. Age fixed-effects include one dummy for each year of age of the individual. The number of observations is marginally lower in IV specifications since, for a few occupations each year, hirings are positive in one commuting zone only, so that the instrument cannot be constructed.

Table 2: Hourly Wages of Stayers - HHI based on hirings

	Log(Hourly Wage)		
	(1)	(2)	(3)
	OLS	Unweighted IV	Weighted IV
$Log(HHI_{l,t})$	-0.0006*	-0.0117***	-0.0126***
	(0.0003)	(0.0018)	(0.0021)
Observations	9,292,858	9,292,825	9,292,825
R^2	0.93	-	-
Kleiberger-Papp F-stat	-	1,265.56	839,11
Individual FE	Yes	Yes	Yes
Age FE	Yes	Yes	Yes
Labor market FE	Yes	Yes	Yes
Establishment*Year FE	Yes	Yes	Yes
Full-timer dummy	Yes	Yes	Yes

Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Standard errors are clustered at the labor-market-by-time level. Age fixed-effects include one dummy for each year of age of the individual. The number of observations is marginally lower in IV specifications since, for a few occupations each year, hirings are positive in one commuting zone only, so that the instrument cannot be constructed.

Table 3: Daily Wages of Full-time Stayers - HHI based on hirings
With Spell Fixed-Effects

	(1)	(2)	(3)
	Log(Daily Wage) OLS	Log(Daily Wage) Unweighted IV	Log(Daily Wage) Weighted IV
$Log(HHI_{l,t})$	-0.0004*	-0.0131***	-0.0180***
	(0.0002)	(0.0015)	(0.0018)
Observations	7,034,688	7,034,661	7,034,661
R^2	0.94	-	-
Kleiberger-Papp F-stat	-	1,010.00	629.55
Spell FE	Yes	Yes	Yes
Age FE	Yes	Yes	Yes
Labor market FE	Yes	Yes	Yes
Establishment*Year FE	Yes	Yes	Yes

Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Standard errors are clustered at the labor-market-by-time level. Age fixed-effects include one dummy for each year of age of the individual. The number of observations is marginally lower in IV specifications since, for a few occupations each year, hirings are positive in one commuting zone only, so that the instrument cannot be constructed.

Table 4: Daily Wages of Full-time Stayers - HHI based on employment

	(1)	(2)	(3)
	Log(Daily Wage)	Log(Daily Wage)	Log(Daily Wage)
	OLS	Unweighted IV	Weighted IV
$\text{Log}(HHI_{l,t})$	-0.0004	-0.0232***	-0.0282***
	(0.0005)	(0.0016)	(0.0021)
Observations	7,119,550	7,119,550	7,119,550
R^2	0.93	-	-
Kleiberg-Papp F-stat	-	1,844.76	1,156.36
Individual FE	Yes	Yes	Yes
Age FE	Yes	Yes	Yes
Labor market FE	Yes	Yes	Yes
Establishment*Year FE	Yes	Yes	Yes

Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Standard errors are clustered at the market-by-time level. Age fixed-effects include one dummy for each year of age of the individual.

A Appendix

Table A1: Average Labor Market Concentration 2010-2017

2010-2017	(1)	(2)	(3)	(4)	(5)	(6)
	Mean	SD	P25	P50	P75	P90
HHI based on Hirings	0.1172	0.1831	0.0162	0.0461	0.1280	0.3194
HHI based on Employment	0.0911	0.1595	0.0103	0.0308	0.0909	0.2444

Note: The values of HHIs reported in the table are weighted by employment on December 31st of each year in each local labor market.

Table A2: Share of Local Labor Markets by Concentration Level in France over Time

Year	Unconcentrated (HHI < 0.15)	Medium-concentrated (0.15 ≤ HHI < 0.25)	Highly-concentrated (HHI ≥ 0.25)
HHI based on Hirings			
2010-2017	78.0	8.9	13.1
2010	78.8	8.1	13.0
2011	78.3	8.5	13.2
2012	78.0	9.3	12.7
2013	78.4	8.5	13.1
2014	76.9	9.4	13.7
2015	78.0	8.9	13.1
2016	77.2	9.5	13.3
2017	78.8	9.0	12.3
HHI based on Employment			
2010-2017	83.6	6.7	9.7
2010	83.6	6.4	10.0
2011	83.1	6.7	10.2
2012	83.8	6.5	9.7
2013	83.8	6.4	9.9
2014	83.7	6.7	9.6
2015	83.5	6.9	9.6
2016	83.3	7.2	9.5
2017	84.1	6.8	9.2

Note: Proportion of local labor markets (weighted by their employment on December 31st of each year) according to their level of concentration. Our categorization is similar to the one used by the US Department of Justice.

Table A3: Individual characteristics

	Mean	Std Deviation	Observations
			All Employees
Stayers	0.732	0.443	12,914,280
New hires in employment year before	0.187	0.390	12,914,280
Full-time workers	0.727	0.446	12,914,280
Age	38.06	12.34	12,914,280
Males	0.577	0.494	12,914,280
Daily nominal wage (€)	59.94	73.03	12,914,277
Daily nominal wage of full-timers (€)	70.70	79.42	9,385,841
Hourly nominal wage (€)	13.19	15.61	12,914,280
			Stayers
Full-time workers	0.757	0.429	9,449,981
Age	40.18	11.91	9,449,981
Males	0.579	0.494	9,449,981
Daily nominal wage (€)	65.75	80.89	9,449,979
Daily nominal wage of full-timers (€)	75.74	86.96	7,157,181
Hourly nominal wage (€)	14.12	16.91	9,449,981
			New Hires
In employment year before	0.697	0.459	3,464,299
Full-time workers	0.643	0.479	3,464,299
Age	32.26	11.62	3,464,299
Males	0.568	0.495	3,464,299
Daily nominal wage (€)	44.11	41.08	3,464,298
Daily nominal wage of full-timers (€)	54.54	43.98	2,228,660
Hourly nominal wage (€)	10.64	10.95	3,464,299

Note: Each observation is an individual-by-establishment-by-year triple. Daily nominal wages are defined as the ratio of gross annual wages to the number of days in employment in a year. Hourly nominal wages are defined as the ratio of gross annual wages to the reported number of hours worked in a year. A new hire in a given year is a worker who did not work for any establishment of the firm the year before. A stayer is a worker who was already employed in one of the establishments of the firm the year before.

Table A4: Hourly Wages of New Hires - HHI based on hirings

	Log(Hourly Wage)		
	(1)	(2)	(3)
	OLS	Unweighted IV	Weighted IV
$Log(HHI_{l,t})$	0.0019 (0.0014)	-0.0213*** (0.0048)	-0.0228*** (0.0054)
Observations	3,374,576	3,374,564	3,374,564
R^2	0.89	-	-
Kleiberger-Papp F-stat	-	821.41	730.59
Individual FE	Yes	Yes	Yes
Age FE	Yes	Yes	Yes
Labor market FE	Yes	Yes	Yes
Establishment*Year FE	Yes	Yes	Yes
Full-timer dummy	Yes	Yes	Yes
Employed year before	Yes	Yes	Yes

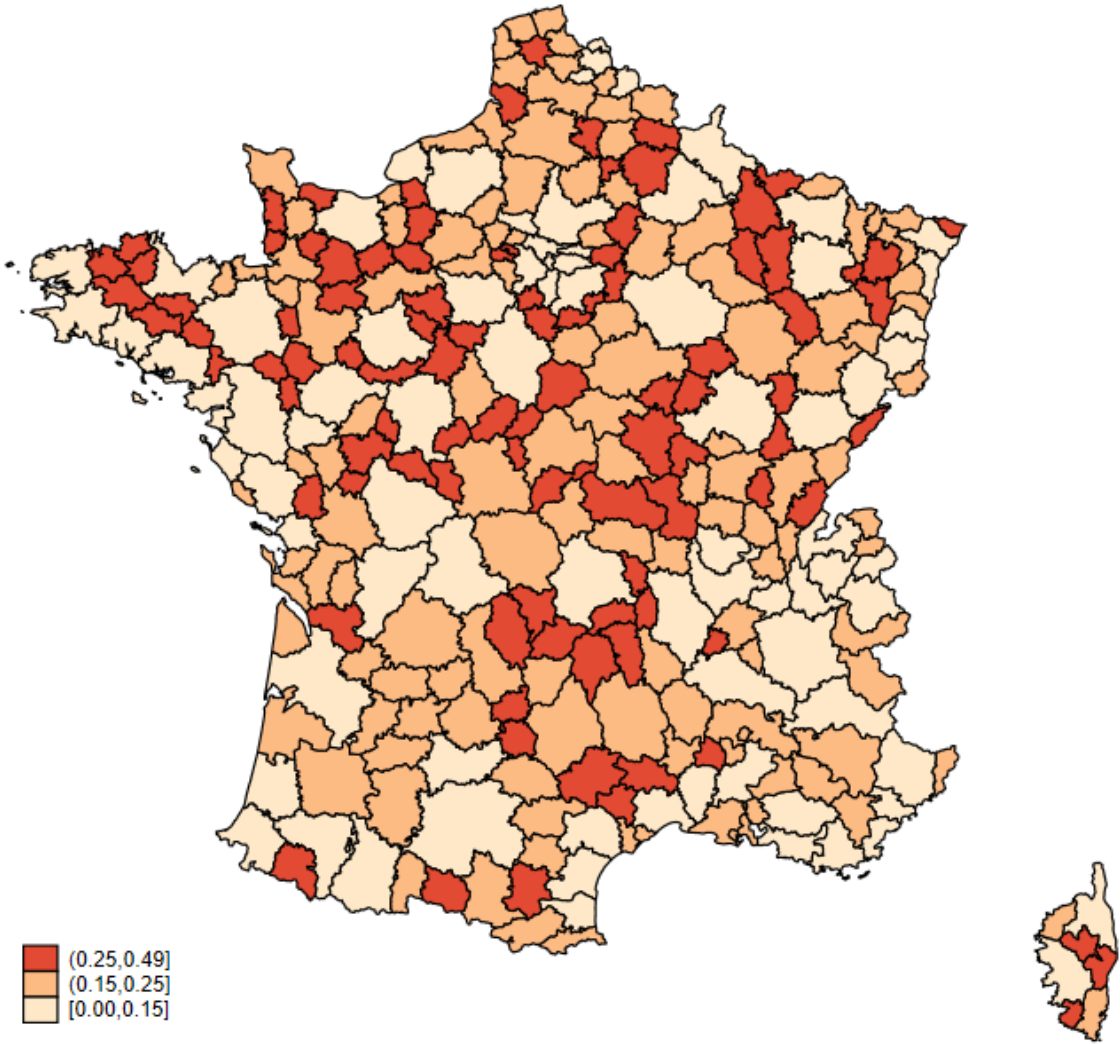
Note: *** p<0.01, ** p<0.05, * p<0.1. Standard errors are clustered at the labor-market-by-time level. Age fixed-effects include one dummy for each year of age of the individual. The number of observations is marginally lower in IV specifications since, for a few occupations each year, hirings are positive in one commuting zone only, so that the instrument cannot be constructed.

Table A5: Daily Wages of Full-time New Hires - HHI based on employment

	(1)	(2)	(3)
	Log(Daily Wage) OLS	Log(Daily Wage) Unweighted IV	Log(Daily Wage) Weighted IV
$Log(HHI_{l,t})$	0.0012 (0.0027)	-0.0217*** (0.0098)	-0.0273*** (0.0101)
Observations	2,178,264	2,178,264	2,178,264
R^2	0.89	-	-
Kleiberger-Papp F-stat	-	1,375.05	992.54
Individual FE	Yes	Yes	Yes
Age FE	Yes	Yes	Yes
Labor market FE	Yes	Yes	Yes
Establishment*Year FE	Yes	Yes	Yes
Employed year before	Yes	Yes	Yes

Note: *** p<0.01, ** p<0.05, * p<0.1. Standard errors are clustered at the market-by-time level. Age fixed-effects include one dummy for each year of age of the individual.

Figure A1: Labor market concentration based on Hirings in French commuting zones 2010-2017



Note: Average HHI (weighted by employment on December 31st) by commuting zone.