Wage Posting or Wage Bargaining?[1]

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Abstract

Labor economists' theoretical understanding of rent sharing between workers and employers in frictional labor markets far outstrips the available empirical evidence on wage determination. In particular, whether employers commit to making non-negotiable, "take-it-or-leave-it" offers to their workers (something we will loosely refer to as "wage posting"), or rather engage in some form of bargaining over wages largely remains an open empirical question. Which employers "post" wages and which bargain over them? In which segments of the labor market does wage posting (bargaining) prevail? Do different wage setting models coexist within the firm, possibly differing across occupations, or is wage posting (bargaining) a feature that is intrinsic to the firm? Those largely unanswered questions have huge repercussions on our understanding of such key issues as wage inequality, job turnover and job assignment, individual career dynamics, or labor market efficiency.

In this paper, we leverage unique French data matching job ads with hires in matched employer-employee data to (i) design a new empirical protocol to distinguish between classes of wage setting models, and (ii) provide an empirically based taxonomy of firms over the wage posting-wage bargaining spectrum. We proceed in four steps. First, we develop an empirical method to determine whether an "employer" (which we define as a particular occupation in a particular firm) bargains over the wages of their new hires or not. Our method is based on the relationship between the realized wage, the advertised wage and a proxy for the hire's outside option. Second, we construct a novel dataset that matches job ads with new hires from a matched employer-employee dataset on the universe of job matches in France. Importantly, the merged data provide us with measures of the advertised wage, the realized wage, the hire's outside option and other quantities relevant to the implementation of our empirical protocol. Thirdly, we take our protocol to the data and demonstrate its usefulness in detecting meaningful differences in wage setting practices across occupations. Finally, we use machine-learning techniques to classify firms into groups over the

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wage posting-wage bargaining spectrum and we document the firm- and market-level characteristics of those groups.

Our empirical procedure is based on the notion that models of wage posting and wage bargaining have different predictions about the relationship between realized wages, advertised wages and the hire's outside option. In an ex-post *bargaining* model, the realized wage should primarily be a function of the worker's outside option. Hence, we expect that – conditional on the worker's outside option (her reservation wage or earning opportunities in previous firms) – the realized wage should be uncorrelated with the advertised wage. Conversely, in an ex-ante *wage-posting* model, the advertised wage should be a strong predictor of the realized wage. As a result, conditional on the advertised wage, there should be no correlation between the worker's outside option and her realized wage. These considerations lead quite naturally to compare the conditional explanatory power of advertised wages and outside options in explaining variation in realized wages. Two challenges emerge in implementing this test empirically. The first is the measurement of a worker's outside option. The second is controlling for workers' and hiring firms' heterogeneity. We proxy a worker's outside option with the fixed-effect of the past firm she was employed at, estimated using an AKM model (Abowd, Kramarz and Margolis, 1999). We control for worker and hiring firm heterogeneity by conditioning our model on the worker's past wage and the current firm's AKM-estimated fixed effect.

The empirical model that we use to determine the nature of wage setting is:

$$w_{ivjkt}^R = \alpha_0 + \alpha_1 w_{vt}^V + \alpha_2 f_{k(i)} + \alpha_3 f_{j(i)} + \alpha_4 w_{it-1} + X_{it}'\beta + \gamma_t + \varepsilon_{ivjkt} \qquad (1)$$

where w_{ivjkt}^R is the log realized wage of worker i hired on vacancy v by firm j in year t and previously employed by firm k; w_{vt}^V is the log wage advertised on vacancy v; $f_{k(i)}$ is the AKM estimated fixed effect of the hiring firm k; $f_{j(i)}$ is the AKM estimated fixed effect of firm j; w_{it-1} is the log of worker's i wage in $t-1$; X_{it}' is a set of individual covariates (age, gender, past qualification, location); γ_t is a year fixed effect and ε_{ivjkt} an error term. The parameters of interest are α_1 and α_2, where the former captures the extent of wage posting and the latter that of wage bargaining.

Our data on job ads are sourced from pole-emploi.fr, a vacancy posting website operated by the French Public Employment Service (*Pôle Emploi*). Any private firm can use this website to post job ads and screen job seekers' profiles free of charge. Until 2015, for each vacancy, we have information on the identifier of the posting firm, the job title, occupation, working hours, work location, date of publication, and advertised wage. The latter is complemented by a text that can provide additional information on wage setting and remuneration (e.g. whether compensation is tied to experience or qualification, or whether it is subject to negotiation). *Pôle Emploi* is one of the main vacancy-posting websites in France, covering almost 50% of hires recruited via online job advertising.[2] We also have access to administrative matched employer-employee registers (*Déclarations Annuelles de Données Sociales*, DADS) providing information on yearly

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employment spells on the universe of job matches in France. For each employer-employee match we have information on earnings, hours worked, occupation, age, gender, qualification, workplace location (establishment), industry and firm size. At the firm level, we also have balance-sheet data. We combine these data sources to obtain a unique dataset of job ads matched with hires and their working histories (as derived from the matched employer-employee data). Using DADS, we select all new hires between 2010 and 2015 and we match each hire to a vacancy posted by the hiring firm in the same semester and the same occupation (based on about 200 occupation categories).

We first demonstrate the usefulness of model (1) by showing that the magnitudes of $\hat{\alpha}_1$ and $\hat{\alpha}_2$ are negatively associated across broad qualifications, with $\hat{\alpha}_1$ becoming progressively smaller and $\hat{\alpha}_2$ progressively larger as we move up the job ladder. Consistent with the notion that longer non-employment durations dissipate a worker's bargaining power, we also show evidence of a negative gradient of $\hat{\alpha}_2$ with respect to the duration of the previous non-employment spell. Finally, we will implement a machine-learning classification of firms into clusters based on estimates of α_1 and α_2. The statistical classification of firms will allow us to inspect and document properties of labor markets populated by "bargaining" and/or "posting" firms, and to shed light on a host of unanswered questions regarding the prevalence of different wage setting models across segments of the labor market (e.g. across men and women, occupations, sectors, markets with different levels of concentration, etc.).

We view our contribution as follows. First, even though our approach is decidedly reduced form, we aim to inform the large and very successful body of work on structural models of labor markets with frictions, a far from exhaustive list of which includes Eckstein and Wolpin (1995), Van den Berg and Ridder (1998), Bontemps et al. (1999, 2000), Postel-Vinay and Robin (2002), Cahuc et al. (2006), Bagger et al. (2014), Taber and Vejlin (2020). In that particular body of work, a small number of papers deserve special mention as they specifically investigate employers' optimal choices of wage determination process, typically allowing firms either to commit to posted wages or to reserve the possibility to bargain ex-post. Those include Postel-Vinay and Robin (2004), Doniger (2015), and Flinn and Mullins (2019). Those papers are either fully theoretical (Postel-Vinay and Robin, 2004), or rely heavily on a model's structure (Doniger, 2015; Flinn and Mullins, 2019). We view our data-driven approach as a complement to those. Second, existing empirical evidence on the prevalence of wage setting models is entirely based on ad-hoc surveys of workers or firms (Hall and Krueger, 2012; Brenzel et al., 2014). We complement this evidence by using a novel combination of administrative data providing high-quality information on vacancy-hire matches, individual working histories and firm-level panel data.

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