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DIRECT EVIDENCE FROM LINKED TEMP AGENCY-WORKER-CLIENT DATA

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### **ABSTRACT**

We estimate how much firms differentiate pay premia between regular and outsourced workers. We study temp agency work arrangements where pay setting has previously escaped measurement because existing datasets do not report links between user firms (the workplaces where temp workers perform their labor) and temp agencies (their formal employers). We overcome this measurement challenge by leveraging unique administrative data from Argentina with such links. We estimate that temp agency workers receive 49% of the workplace-specific pay premia earned by regular workers in user firms: the midpoint between the benchmark for insiders (one) and the competitive spot-labor market benchmark (zero).

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# 1 Introduction

We shed direct light on wage setting for outsourced workers. We study employment mediated by temporary employment agencies (“temp agencies”), where the *workplace* is at a user firm even though the temp agency serves as the formal *employer*. Temp agency work is a facet of outsourcing and, more broadly, nonstandard work arrangements, which have been associated with lower wages and increased inequality (Weil, 2014). Specifically, we focus on firms’ wage policies in the form of pay premia. The between-firm wage dispersion arising from pay premia constitutes a deviation from the law of one price that would arise in spot labor markets (see, e.g., Slichter, 1950; Lester, 1967). These premia can arise in imperfectly competitive labor markets through bargaining, search frictions, or monopsony (see, e.g., Mortensen, 2003; Hornstein, Krusell, and Violante, 2011; Card et al., 2018). A long-standing hypothesis is that nonstandard work arrangements—and specifically, outsourced, temp agency work—erode such pay premia by plausibly operating closer to a spot labor market or by lowering workers’ bargaining power.<sup>1</sup> However, forces such as equity concerns (Card et al., 2012; Breza, Kaur, and Shamdasani, 2017; Dube, Giuliano, and Leonard, 2019; Saez, Schoefer, and Seim, 2019) or the imperfect observability of effort (Akerlof and Yellen, 1986; Katz, 1986) may lead firms to extend firm-specific pay premia even to outsourced labor.

User firms’ wage setting for outsourced labor has so far largely escaped measurement because typical datasets exclusively associate outsourced workers with their formal employer, in our case the temp agency, rather than the workplace, the user firm. This is true for surveys (in addition to the inherent challenges of measuring nonstandard work arrangements based on snapshot survey data, which has recently been documented by Abraham and Amaya, 2018; Abraham et al., 2018; Katz and Krueger, 2018, 2019). But the challenge extends to typical administrative matched employer-employee datasets, which generally do not show links between temp agency workers and user firms. We illustrate this issue in Figure 1. This difficulty has prevented investigation of the relationship between the pay policies of the user firm’s regular workers and its temp workers. An important exception is Goldschmidt and Schmieder (2017), who use outsourcing events of clusters of workers in low-skilled service occupations to measure wage changes in the

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<sup>1</sup>For instance, Katz (2017) describes this view as follows: “When janitors work at Goldman Sachs as Goldman Sachs employees, they tend to share in the firm’s huge productivity benefits and huge rents. But if they work for Joe’s Janitorial Services, they no longer share in those rents.” Similarly, Autor (2008) argues that labor market intermediaries more broadly and specifically including temp agencies, “share a common function, which is to redress—and in some cases exploit—a set of endemic departures of labor market operation from the efficient neoclassical benchmark.” Empirically, Abraham (1990); Dube and Kaplan (2010) and Goldschmidt and Schmieder (2017) present evidence on the wage penalty associated with nonstandard work arrangements and outsourcing.

affected occupations. In addition, they find evidence that this outsourcing effect is larger in firms with initially higher pay premia. This is consistent, for example, with lower rent sharing with outsourced workers.

Our paper overcomes this fundamental measurement challenge by drawing on unique administrative matched employer-employee data on the universe of workers in temporary work arrangements that contain information on both their temp agency and user firms. This linkage permits us to directly study the differentiation of pay premia between regular and temp agency workers within a workplace.

Our research design identifies pay premia by means of the wage changes that accompany worker moves across employers (Abowd, Kramarz, and Margolis, 1999, henceforth AKM). Such workplace pay premia for regular workers are associated with higher productivity (as documented by, e.g., Card et al., 2018) and can hence be interpreted as facets of rent sharing that are directly observable in matched employer-employee data. We also document that worker tenure is longer in firms with higher AKM firm effects, consistent with higher rents and higher-quality jobs. We ask whether these pay premia, whatever their source, are shared with outsourced labor.<sup>2</sup>

In a first step, we compare cross-sectional dispersion measures of workplace-level pay premia separately for regular and temp agency workers. The competitive benchmark for temp workers and the associated law of one price would imply little dispersion among temp workers. Though somewhat smaller compared with regular work arrangements, the dispersion of pay premia of temp agency workers is substantial. Specifically, user firm pay premia for temp workers have a standard deviation of 17.2 log points, but this rises to 20.7 log points in regular work arrangements for the same sample of user firms. These dispersion measures are robust to a split-sample measurement error correction, which shrinks the standard deviations to 15.2 log points for pay policies for temp work arrangements, whereas it leaves the regular work arrangements largely unaffected, at 20.5 log points. Hence, the large degree of wage dispersion that characterizes regular work arrangements extends to the market for temporary agency work, even though it is plausibly less subject to standard labor search frictions (consistent with Hornstein, Krusell, and Violante, 2011).

We also show that temp agency workers are *negatively* selected in terms of their AKM worker fixed effects. Overall, we estimate a penalty from temp labor of about 14%. More-

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<sup>2</sup> Our work thus complements growing evidence documenting that firms may not set pay premia policies equally for all worker types. Using an AKM approach, Card, Cardoso, and Kline (2015) link the gender pay gap with differential rent sharing in Portugal. Gerard et al. (2018) link the racial wage gap with AKM premia differentials and sorting across employers in Brazil. Daruich, Di Addario, and Saggio (2017) document differential rent sharing with workers on fixed-term contracts and open-ended contracts in Italy.

over, firms that hire temp agency workers tend to have *higher* regular worker AKM workplace effects, consistent with high-wage firms' use of outsourcing to save on labor costs. Alternatively, more productive firms both pay higher wages and engage in more complex modes of production.

In a second step, we compare workplace pay premia estimates (AKM firm effects) for temp agency and regular work arrangements *within* firms. We therefore measure the degree to which high-wage firms for regular work arrangements are also high-wage firms for outsourced labor. Here, a view of temp workers treated as insiders in wage setting would predict a slope of one. By contrast, either the competitive spot labor market benchmark or the treatment of temp workers as a separate class of workers would predict a flat line. We find a reduced-form slope of 0.490 for temp agency work arrangements.<sup>3</sup> Our estimates thus imply that temp agency workers receive 49% of the workplace-specific pay premia earned by regular workers in user firms—a substantial markdown and the half point between the benchmark for insiders (one) and the competitive spot-labor market benchmark (zero).

Along another dimension, we find that the market for temp agency labor is subject to similar forces that generate between-firm dispersion in the pay premia in regular labor markets. Specifically, we find that *assortative matching* between temp workers and client firms is substantial: Just as high-wage regular workers sort into high-wage firms, we find that high-wage temp workers sort into high-paying workplaces. We estimate an elasticity of the worker AKM fixed effect to the firm fixed effects of 0.27 for regular workers, compared with a 0.22 effect for temp workers. This result is robust to considering sorting between temp agencies and client firms, for which we find a precisely estimated zero.

We discuss interpretations and implications of our findings in the conclusion section.

## 2 Institutions and Data

**Temporary Work Agencies and Regulation** The Argentinian labor market for temporary work shares characteristics with those of other countries along various dimensions. First, temp agencies in Argentina pay below-average wages (Beccaria and Maurizio, 2017). Second, their business model and regulatory environment are similar to those of OECD countries (OECD/IDB EPL Database, 2015). Finally, about 1.5% of employees were em-

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<sup>3</sup>We also nonparametrically correct for measurement error in the pay premia by splitting regular workers into two groups and taking the slope for these groups as benchmarks (as in Goldschmidt and Schmieder, 2017; Gerard et al., 2018), which slightly flattens the benchmark of the slope of one to 0.974. In the split-sample procedure, we find a reduced-form slope of 0.480 so that the IV analysis implies a 49.3% (0.480/0.974) relative slope.

ployed through a temp agency in 2005 (source: own calculations, SIPA, described below), compared with 0.9% in temp agencies and 1.4% through contract firms in the US (calculations based on February-2005 CPS, see Table 2 in Katz and Krueger, 2018).

Temp workers' labor earnings and payroll taxes are paid by the temp agency (typically monthly, the frequency at which we see administrative earnings). We draw on a representative labor force survey (*Encuesta Permanente de Hogares*) to compare weekly hours of work of temp agency and regular workers and find that they are similar (36.18 hrs/week, SD 12.15, vs. 34.61 hrs/week, SD 13.16, respectively; see Appendix Figure A.1 Panel (b)). As in many countries, there are a number of formal regulations for temp agency pay. *De jure*, the temp agency ought to pay the worker the wage specified by the collective bargaining agreement corresponding to the actual job, or the wage effectively paid in the user company. An open question is the degree to which such common regulations are binding and complied with, or whether firms find ways to circumvent the policies (as with potential gender or racial wage gaps, even in the presence of anti-discrimination laws). For example, temp wage penalties and associated cost savings may point to imperfect compliance. In our study, partial compliance may be a formal institutional factor that contributes to similar pay policies across types within a firm, although we cannot definitely distinguish this channel from others, as we discuss in Section 5.

**Administrative Social Security Records (SIPA)** We use monthly administrative employer-employee matched data from 1996 to 2018 from the national social security system (*Sistema Integrado Previsional Argentino*, or SIPA). The dataset (described in further detail in, e.g., Tortarolo, 2019) covers the universe of formal workers employed in all regions, industries, and types of contracts. This corresponds to more than 15 million workers and 40 million job spells. The dataset includes information on workers (gender and age) and their jobs (type of contract, part-time/full-time indicator, compensation components), as well as some characteristics of the firm (sector and province). SIPA also provides firm and worker tax identifiers, and reports total wages earned in each month, which include all forms of payment that are taxable or subject to social security contributions. These measures are not top-coded. We CPI-deflate all payments to correspond to January 2008 Argentine Pesos.

**Administrative Worker-Client-Agency Linkage (SR)** In addition, we exploit administrative data linking the temp agency employing the worker and the user firms via tax identifiers of the temp workers, temp agencies, and clients (*Simplificacion Registral*, or SR), which is available since 2008. This unique data source stems from a 2006 reform of temp

agency work, which required that temp agencies register temp workers with the Ministry of Labor, at a bimonthly frequency, and submit information on the worker, user company, position type, remuneration, and contract start and end dates. These filings are sworn statements and audited, and hence are of administrative quality.

**Defining Earnings Concepts** We use SIPA for earnings data, in which we observe the monthly nominal pretax compensation paid by formal employers. For temp workers, compensation is paid by the temp agency. To remove ambiguity about earnings sources (workplaces) and hours and days worked, we restrict our sample of temp workers to those providing services to a single user firm in a given month, and drop temp spells with simultaneous user firms or partial-month spells. We winsorize earnings at the 1% level on both sides. We also drop earnings with real income less than half the real 2008 minimum wage (in 2008, the real minimum earnings were USD340 per month) adjusted by the average annual growth rate (1.4%) of real income for the entire sample.

### 3 Wages for Temp Agency Work in Argentina

**Summary Statistics** In Appendix Tables A.1 and A.2, we provide descriptive evidence on the types of workers in regular and temp agency arrangements, along with the characteristics of user firms. Overall, we find that temp agency workers tend to be younger (mean age of 28 vs. 38), and are more likely to be men (79% vs. 70%). For each industry, Appendix Figure A.1 Panel (a) plots temp agency employment as a share of total national temp agency employment against its share in national regular employment. Deviations from the 45-degree line indicate that a firm accounts for more or less temp employment than predicted by its regular employment share. We find, e.g., that manufacturing relies particularly strongly on temp agency employment, while education and health services and professional business services draw relatively less on such outsourced labor.

**Estimating the Average Temp Agency Work Pay Penalty** We next estimate the pay effect associated with temp agency work. We regress log wages earned by worker  $i$  in period  $t$  on an indicator for temp work,  $\text{TempAgencyArrangement}_{it}$ :

$$\ln w_{it} = \alpha_i + \psi_{J_{i,t}} + \rho \times \text{TempAgencyArrangement}_{it} + X'_{it}\beta + \epsilon_{it}. \quad (1)$$

As basic controls,  $X_{it}$ , we include gender and a cubic polynomial in worker's age as well as industry and year, or industry-by-year effects. Due to the panel nature of the data, we can

also include worker effects,  $\alpha_i$ , which address selection based on permanent differences between workers. As a novel feature of our dataset, we also include workplace  $J$  fixed effects,  $\psi_{J_{i,t}}$ , which allows us to estimate the temp agency work penalty by comparing temp workers with regular workers *in the same workplace*. We estimate (1) based on the procedure in Correia (2017) and cluster standard errors at the worker level.

We report results for the main specifications of (1) in Table 1. Column (1) reports the raw temp effect of -0.133 (SE 0.0005) with only year effects. This effect is reduced substantially to -0.075 (SE 0.001) once we include gender and age controls, particularly since temp agency workers tend to be younger than regular workers (see Appendix Tables A.1 and A.2). We next report specifications with industry or industry-by-year effects, which increases the temp penalty to -0.191 (SE 0.001). When we include worker effects in the next column, we find a point estimate for the penalty of -0.0795 (SE 0.0005), consistent with the previous specification’s overestimation of the temp penalty due to negative worker selection. Next, we add firm effects, foreshadowing our AKM specifications below, and find a larger temp penalty of -0.140 (SE 0.0005). We study the implied selection patterns below.

One possibility beyond the scope of our paper is the degree to which temp agency work may serve as a stepping stone or point of entry (Autor and Houseman, 2010; Autor, Houseman, and Kerr, 2017). The dataset we have introduced will uniquely lend itself to such analyses.

**Estimating Workplace Premia for Regular and Temp Agency Workers** We next estimate modified AKM specifications, in which we allow for separate workplace effects for regular and temp agency workers, which we will then juxtapose in Section 4. Formally, we estimate the following specification:

$$\ln w_{it} = \alpha_i + \psi_{J_{i,t}}^{W_{i,t}} + \xi_{TA_{i,t}}^{\text{TempAgency}} + X'_{it}\beta + \epsilon_{it}, \quad (2)$$

where  $\alpha_i$  are worker fixed effects and  $\psi_{J_{i,t}}^{W_{i,t}}$  are work-arrangement-specific workplace effects.<sup>4</sup> The superscript  $W_{i,t} \in R, T$  indicates whether worker  $i$  is employed through a temp agency ( $T$ ) or a regular employment relationship ( $R$ ) in period  $t$ , and  $J_{i,t}$  denotes the workplace. In addition, we include temp agency effects,  $\xi_{TA_{i,t}}^{\text{TempAgency}}$ , for the temp agency  $TA_{i,t}$  at which a temp agency worker  $i$  is formally employed in period  $t$ . We include as control variables,  $X_{it}$ , a cubic term in worker age and year fixed effects. Intuitively, the

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<sup>4</sup>This specification mirrors analogous specifications in Card, Cardoso, and Kline (2015), Daruich, Di Adario, and Saggio (2017), and Gerard et al. (2018), who allow for separate firm effects by gender, contract modality, and race, respectively. Such a specification can emerge in a model with wage posting and labor supply elasticities to the firm that differ by work arrangement (Card et al., 2018), or in a bargaining model with work-arrangement-specific bargaining powers (Card, Cardoso, and Kline, 2015).



wage changes of movers between different workplaces and work arrangements identify the fixed effects.<sup>5</sup> We estimate (2) in the largest connected set, which captures 60.8% of firms and 95.9% of worker-year-spell observations.

**Which Workers Select into Temp Work?** We plot the estimated fixed effects in the histogram in Figure 2. In Panel (a), we plot AKM worker effects separately for those ever and never employed by a temp agency between 2008 and 2017. The histograms look strikingly similar, although we find a mean difference of 9 log points, which indicates that workers ever employed in a temp agency arrangement were negatively selected, on average, in terms of their person fixed effect. Since our design controls for work arrangements, this effect is not mechanically driven by a higher frequency of temp work.

**Which Firms Hire Temp Workers?** In Panel (b) of Figure 2, we plot the distribution of regular firm effects separately for those firms that ever or never hired temp workers (weighting observations by the number of workers). The histograms show that user firms' pay policies are shifted to the right, with a mean difference in the firm effect of 0.27. Our results thus indicate that firms that outsource labor are *positively* selected in terms of their pay policies for regular workers, i.e., high-paying firms are more likely to have outsourced labor. This pattern is consistent with cost-saving theories of outsourcing, by which high-wage firms seek to lower their wage bill by hiring temp workers. Alternatively, it could reflect selection by which more productive firms pay higher wages and engage in more complex modes of production. Lastly, it could reflect industry composition or firm size effects.

**Assortative Matching** We further investigate the assortative matching of regular and temp agency workers to firms by relating average AKM worker effects for the two types of workers to firms' AKM pay premia (for regular workers) in Appendix Figure A.2. We find positive slopes of 0.27 for regular and 0.22 for temp agency workers, respectively. Hence, the degree of sorting is similar but somewhat less pronounced for temp workers. This is consistent with, for instance, temp agencies assigning their most productive workers to their most productive clients, or with high-wage temp workers managing to obtain the best-paying assignments. The large degree of assortative matching also implies that

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<sup>5</sup>Since we include temp agency fixed effects and workplace effects, these effects are not separately identified in cases in which a user firm only hires temp workers from one temp agency and the temp agency, in turn, only provides workers to one user firm. Thus, our estimates will be identified off firms with multiple connections within a connected set.

the temp labor market appears to be subject to similar forces that are known to amplify between-firm wage dispersion.

In addition, we investigate the sourcing strategies of user firms by comparing the average temp agency premium to their regular worker workplace premium, i.e., asking whether high-wage firms hire from high-wage temp agencies. This additional analysis complements the worker-based analysis above, recognizing that the market for temp labor is intermediated by agencies. If, for example, high-wage temp agencies provide services to high-wage client firms, then the total assortative matching may be even larger. Here, we find a flat slope of -0.007, rejecting the hypothesis of assortative matching between temp agencies and client firms on the basis of AKM pay premia (Appendix Figure A.3). Overall, we therefore find considerable sorting of high-wage workers into high-wage firms even among temp workers, but little sorting between temp agencies and client firms in terms of their respective wage premia.

**Between-firm Dispersion in Pay Policies for Regular and Temp Workers** Most importantly for our goal of understanding intra-firm pay policy differences, in Panel (c) of Figure 2, we plot the distribution of workplace effects for regular and temp work arrangements *in the sample of user firms*. These firms relying on temp labor are larger, as they make up 30.6% (1%) of our original sample of firm-month (total firms) observations. Here, we find a downward shift in workplace effects for temp compared to regular work arrangements. The average difference of the mean pay premium is 17 log points lower for temp work arrangements compared with regular ones. This difference reflects the average temp work arrangement effect, holding the workplace fixed, in this sample.

Importantly, the dispersion of the workplace effects is *nearly as high* for temp agency workers' user firms as for the workplaces of regular workers—a stark rejection of the law of one price for temp agency workers. Specifically, the raw standard deviation in the pay premia is 17.2 log points for temp workers and 20.7 log points for regular workers.

We also implement a measurement error correction based on a split-sample IV procedure, leading us to scale down the standard deviation for the pay premia of temp agency workers to 15.2 and that of regular workers to 20.5 log points.<sup>6</sup> The large remaining degree of dispersion following this simple split-sample approach also validates our AKM fixed

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<sup>6</sup>Specifically, we split our sample of workers into two random groups  $S_1$  and  $S_0$  and estimate the AKM specification (2) separately in both samples. We then calculate the covariance of the two separate sets of fixed effects within each work arrangement. Let  $\widehat{\psi}_J^{R,S_1} = \psi_J^R + \widehat{\xi}_J^{R,S_1}$  denote the estimate of the firm fixed effect for regular work arrangements, equaling the true firm effect plus estimation error. We then have  $\text{cov}(\widehat{\psi}_J^{R,S_1}, \widehat{\psi}_J^{R,S_0}) = \text{cov}(\psi_J^R + \widehat{\xi}_J^{R,S_1}, \psi_J^R + \widehat{\xi}_J^{R,S_0}) = \text{var}(\psi_J^R)$  as long as  $\text{cov}(\widehat{\xi}_J^{R,S_1}, \widehat{\xi}_J^{R,S_0}) = 0$ , and analogously for  $\text{var}(\psi_J^T)$ . The measurement error correction leads us to shrink the standard deviation of regular work arrangement workplace effects by 0.97% and the one for temp agency work arrangements by 11.6%.

effect as a measure of heterogeneous firms' pay policies.

Overall, the standard deviation for temp workers is therefore around a quarter below that of regular workers, indicating that temp labor markets appear somewhat closer to—but still considerably far from—complying with the law of one price that would be predicted to prevail in a competitive spot labor market.

## 4 Do High-Wage Firms Share Pay Premia With Temp Agency Workers?

Our core specification relates to the workplace pay premia between temp agency and regular workers in the same workplace. These patterns could, for example, reflect the relative degree of rent sharing and/or the degree to which employers can differentiate the pay of outsourced labor.

**Strategy: Comparing Temp and Regular Pay Premia Within Client Firms** Building on (2), we use the estimated workplace pay premia received by temp agency workers,  $\psi_J^T$ , and compare them with those of their peers in regular employment relationships at the same workplace,  $\psi_J^R$ :

$$\psi_J^T = \alpha + \gamma\psi_J^R + \nu_J. \quad (3)$$

Our coefficient of interest is  $\gamma$ , the slope that captures the elasticity of temp pay premia to regular pay premia. We estimate (3) with OLS.<sup>7</sup>

**Polar Benchmarks: Law of One Price vs. Insiders** We highlight two polar benchmarks for the slope  $\gamma$ . First, if firms' pay policies for outsourced workers mirror those for insiders in regular work arrangements, we would expect  $\gamma = 1$ . This benchmark would arise in the presence of similar degrees of rent sharing and rents to be shared, or institutional norms, formal or informal, preventing firms from differentiating pay within the firm across work arrangements. Second, if firms pay a market price for temp agency workers, or if temp pay premia are unrelated to regular premia, then we would expect  $\gamma = 0$ .

**Results** We report binned scatter plots of  $\psi_J^T$  plotted against  $\psi_J^R$  in Figure 3. Panel (a) does so for levels, and Panel (b) repeats the analysis but considers changes in pay premia (based on splitting our sample period in half). Here, we weight firm observations by total

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<sup>7</sup>In our notation, we simply denote  $\widehat{\psi}_J^R$  as  $\psi_J^R$  and analogously  $\widehat{\psi}_J^T$  as  $\psi_J^T$ . Below, we also correct for measurement error in  $\psi_J^R$  with a split-sample IV procedure.

monthly observations. Panel (a) indicates that the empirical pay premia trace out a slope of  $\gamma^{OLS} = 0.490$  (SE  $5.73 \cdot 10^{-5}$ ). That is, comparing two firms, A and B, with B offering a 10% pay premium for its regular workers compared with firm A, the corresponding pay premium for temp agency workers at B vs. A would be predicted to be 4.9%. Hence, firms do appear to extend their pay premia to outsourced labor, but only pass on half the amount.

**Measurement Error Correction: Split Sample IV** We now probe the robustness of our findings. First, we account for the fact that measurement error may lead to a downward bias in  $\gamma^{OLS}$ . The effects  $\psi_J^R$  are generated regressors such that the variance of  $\psi_J^R$  captures both true variation in regular workers' pay premia across workplaces and noise due to sampling variability (Andrews et al., 2008; Kline, Saggio, and Sølvsten, 2019).

To gauge the quantitative importance of measurement error, we implement a simple split-sample procedure (see, e.g., Goldschmidt and Schmieder, 2017; Gerard et al., 2018, for similar resolutions). We find a corrected coefficient of  $\gamma^{IV} = 0.493$  (SE  $5.87 \cdot 10^{-5}$ ). Specifically, we split the universe of workers into two randomly drawn groups and separately estimate regular workplace effects in AKM specifications for the two samples, which we label  $S_1$  and  $S_0$ . We then regress the estimates of  $\psi_J^{R,S_1}$  on those of  $\psi_J^{R,S_0}$ . If there is no sampling variability or measurement error, we would expect a coefficient of one for this regression; if the workplace pay premia dispersion only reflects noise, then we would expect a coefficient of zero. In Figure 4 Panel (a), we plot this first stage relationship between  $\psi_J^{R,S_1}$  and  $\psi_J^{R,S_0}$ , and find a coefficient of 0.974 (SE  $2.2 \cdot 10^{-5}$ ,  $R^2 = 0.9348$ ) among our sample of user firms. In the split-sample setting, we find a quantitatively nearly identical reduced-form slope of 0.480 compared to our OLS coefficient of 0.490. Our estimates thus lead to an IV estimate of  $\gamma^{IV} = 0.480/0.974 = 0.493$  (SE  $5.87 \cdot 10^{-5}$ ) from a specification in which  $\psi_J^{R,S_0}$  serves as an instrument for  $\psi_J^{R,S_1}$  (with a first-stage coefficient of 0.974). Hence, the measurement error correction has essentially no effect on our findings.

Our design finds an intermediate degree of pay policy alignment, even though it sidesteps the fact that temp agency workers only have a temporary attachment to a particular user firm. If pay premia only accrue to new hires once they become stably employed incumbents (as in Kline et al., 2019, who document differential rent sharing with new hires and incumbents), or if pay compression works within comparable jobs, then it may not be only the work arrangement but also the limited attachment that drive our attenuated alignment of pay policies. We hypothesize that an alternative benchmark based on separately estimated AKM effects for regular workers with lower attachment—such as with, e.g., shorter tenure or on fixed-term contracts—could hence yield higher implied IV effects.

**Do High-Wage Firms Offer Better Jobs?** We finally assess whether high-wage firms offer better jobs by studying the cross-sectional relationship between tenure and pay premia. This line of analysis follows the revealed-preference approach, whereby good jobs last longer (see, e.g., Krueger and Summers, 1988). If, for example, higher pay premia reflected only compensating differentials, workers would be indifferent between jobs with higher or lower pay premia. However, we find a strong positive relationship between tenure and pay premia, as shown in Figure 4 Panel (b). Quantitatively, a 10% higher AKM pay premium for regular workers is associated with a 4 months longer tenure.<sup>8</sup> Our evidence is thus consistent with high-wage firms offering better, higher-surplus jobs and sharing rents with their regular workers, rather than merely reflecting, e.g., compensating differentials or hours differences.

## 5 Interpretation and Implications

Overall, our findings suggest that a labor market that is moving away from regular work arrangements and closer to a spot market, such as one mediated by temp agencies, does appear to lower wage dispersion to a limited degree: Firms appear to pay only half of the workplace-specific pay premium to temp workers. We close with interpretations of our findings and a discussion of potential implications.

**Why Do Firms Compress Pay Premia for Temp Workers?** One reading of the estimate is that the glass is half empty: Workers in temporary work arrangements do not appear to share in the rents, as proxied for by AKM pay premia, of a firm as much as workers who are formally and directly employed at their place of work. One explanation draws on bargaining, with temp workers having lower bargaining power (analogous to the gender wage gap and rent sharing in Card, Cardoso, and Kline, 2015). Alternatively, three-party bargaining—between the temp workers, user firm, and temp agency—may lead the temp agency to appropriate some of the rents; similarly, double marginalization may be occurring. Alternatively, temp agency labor supply to specific firms may simply be more elastic (as in the model in Card et al., 2018, which gives rise to an AKM specification). The attenuated slope is also consistent with findings by Daruich, Di Addario, and Saggio (2017) that lower firing costs (in fixed-duration jobs) are associated with lower rent sharing.

The attenuation of pay policy premia may also contribute to the ongoing debate regarding the forces that motivate firms to outsource labor (see, e.g., Abraham and Taylor,

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<sup>8</sup>A 4-month increase corresponds to about a 10% increase in tenure, so that the elasticity of tenure w.r.t. pay premia is about one. Our evidence is consistent with more recent work by Bassier, Dube, and Naidu (2019) based on matched employer-employee data from Oregon.

1996; Houseman, Kalleberg, and Erickcek, 2003; Autor, 2003; Mas and Pallais, forthcoming, for existing evidence). Here, our findings suggest that in particular, high-wage firms can moderately cut labor costs by relying on temp workers—but to a lesser degree than the competitive benchmark would have suggested, as they still appear to pay a premium even to outsourced labor.

**Why Do Firms Pass on Such a Large Share of Pay Premia to Temp Workers?** Alternatively, the glass is half full: Our estimates reveal considerable evidence that pay premia are shared with temp workers, compared with the competitive spot labor market benchmark for temp agency labor with wages equalized across employers. The considerable degree of pay premia sharing is consistent with theories of fairness norms in the workplace reflected in workers' dislike for pay differences that lead to pay compression (see, e.g., Bewley, 2009; Card et al., 2012; Breza, Kaur, and Shamdasani, 2017; Saez, Schoefer, and Seim, 2019; Dube, Giuliano, and Leonard, 2019). Alternatively, efficiency wage theories based on moral hazard would imply that incentive compensation would pass through into pay for both regular and temp workers performing the same job. Finally, temp agencies themselves may have incentives to increase rent sharing with temp workers. Temp agencies' revenues stem from fees charged to user firms, which are typically computed as a fraction of a temp worker's wage (e.g., about 1.5 to 2% based on conversations with leading temp agencies).

Viewed through the lens of labor market monopsony, the alignment of pay premia would imply that the firm-specific supply of temp labor is far from perfectly elastic and far from a competitively supplied intermediate service. Sources of imperfectly elastic supply include heterogeneity in workers' preferences for certain employers or mobility costs, factors that also plausibly guide temp labor supply. It may also reflect monopolistic behavior by the temp agency itself, which intermediates temp labor supply.

Another interpretation is partial but considerable compliance with the standard regulatory framework, which would *de jure* mandate firms to pay equal wages across work arrangements for the same job. It is beyond the scope of our paper to isolate the role of this channel. Yet, Argentina's relatively large informal sector suggests that our setting plausibly leaves some room for noncompliance compared with other countries. We also point to analogous evidence on differential rent sharing between men and women (Black and Strahan, 2001; Card, Cardoso, and Kline, 2015) despite laws that purport to ban discrimination based on gender.

## References

- Abowd, John, Francis Kramarz, and David Margolis. 1999. "High Wage Workers and High Wage Firms." *Econometrica* 67 (2):251–333.
- Abraham, Katharine. 1990. "Restructuring the Employment Relationship: The Growth of Market-Mediated Work Arrangements." *New Developments in the Labor Market: Toward a New Institutional Paradigm* :85–119.
- Abraham, Katharine and Ashley Amaya. 2018. "Probing for Informal Work Activity." *NBER Working Paper No. 24880* .
- Abraham, Katharine, John Haltiwanger, Kristin Sandusky, and James Spletzer. 2018. "Measuring the Gig Economy: Current Knowledge and Open Issues." *NBER Working Paper No. 24950* .
- Abraham, Katharine and Susan Taylor. 1996. "Firms' Use of Outside Contractors: Theory and Evidence." *Journal of Labor Economics* 14 (3):394–424.
- Akerlof, George and Janet Yellen. 1986. *Efficiency Wage Models of the Labor Market*. Cambridge University Press.
- Andrews, Martyn, Len Gill, Thorsten Schank, and Richard Upward. 2008. "High Wage Workers and Low Wage Firms: Negative Assortative Matching or Limited Mobility Bias?" *Journal of the Royal Statistical Society: Series A (Statistics in Society)* 171 (3):673–697.
- Autor, David. 2003. "Outsourcing at Will: The Contribution of Unjust Dismissal Doctrine to the Growth of Employment Outsourcing." *Journal of Labor Economics* 21 (1):1–42.
- . 2008. "The Economics of Labor Market Intermediation." *NBER Working Paper No 14348* .
- Autor, David and Susan Houseman. 2010. "Do Temporary-Help Jobs Improve Labor Market Outcomes for Low-Skilled Workers? Evidence from "Work First"." *American Economic Journal: Applied Economics* :96–128.
- Autor, David, Susan Houseman, and Sari Pekkala Kerr. 2017. "The Effect of Work First Job Placements on the Distribution of Earnings: An Instrumental Variable Quantile Regression Approach." *Journal of Labor Economics* 35 (1):149–190.
- Bassier, Ihsaan, Arindrajit Dube, and Suresh Naidu. 2019. "Monopsony in Movers: The Elasticity of Labor Supply to Firm Wage Policies." *Working Paper* .
- Beccaria, Luis Alberto and Roxana del Luján Maurizio. 2017. "Mercado de Trabajo y Desigualdad en Argentina. Un Balance de las Últimas Tres Décadas." *Working Paper*: <https://ri.conicet.gov.ar/handle/11336/36645> .
- Bewley, Truman. 2009. *Why Wages Don't Fall During a Recession*. Harvard University Press.
- Black, Sandra and Philip Strahan. 2001. "The Division of Spoils: Rent-Sharing and Discrimination in a Regulated Industry." *American Economic Review* 91 (4):814–831.

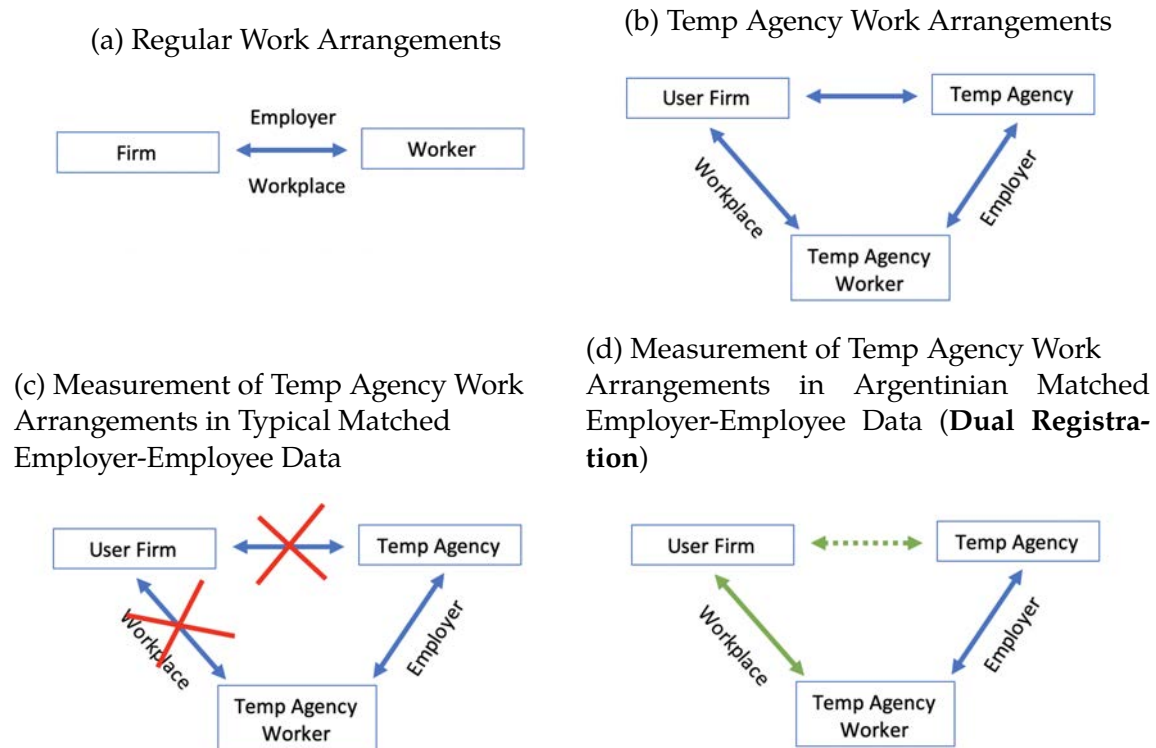
- Breza, Emily, Supreet Kaur, and Yogita Shamdasani. 2017. "The Morale Effects of Pay Inequality." *The Quarterly Journal of Economics* 133 (2):611–663.
- Card, David, Ana Rute Cardoso, Joerg Heining, and Patrick Kline. 2018. "Firms and Labor Market Inequality: Evidence and Some Theory." *Journal of Labor Economics* 36 (S1):S13–S70.
- Card, David, Ana Rute Cardoso, and Patrick Kline. 2015. "Bargaining, Sorting, and the Gender Wage Gap: Quantifying the Impact of Firms on the Relative Pay of Women." *The Quarterly Journal of Economics* 131 (2):633–686.
- Card, David, Alexandre Mas, Enrico Moretti, and Emmanuel Saez. 2012. "Inequality at Work: The Effect of Peer Salaries on Job Satisfaction." *American Economic Review* 102 (6):2981–3003.
- Correia, Sergio. 2017. "Linear Models With High-Dimensional Fixed Effects: An Efficient and Feasible Estimator." *Working Paper* .
- Daruich, Diego, Sabrina Di Addario, and Raffaele Saggio. 2017. "The Effects of Partial Employment Protection Reforms: Evidence From Italy." *UBC Working Paper* .
- Dube, Arindrajit, Laura Giuliano, and Jonathan Leonard. 2019. "Fairness and Frictions: The Impact of Unequal Raises on Quit Behavior." *American Economic Review* 109 (2):620–63.
- Dube, Arindrajit and Ethan Kaplan. 2010. "Does Outsourcing Reduce Wages in the Low-Wage Service Occupations? Evidence From Janitors and Guards." *ILR Review* 63 (2):287–306.
- Gerard, François, Lorenzo Lagos, Edson Severnini, and David Card. 2018. "Assortative Matching or Exclusionary Hiring? The Impact of Firm Policies on Racial Wage Differences in Brazil." *NBER Working Paper No. 25176* .
- Goldschmidt, Deborah and Johannes Schmieder. 2017. "The Rise of Domestic Outsourcing and the Evolution of the German Wage Structure." *The Quarterly Journal of Economics* 132 (3):1165–1217.
- Hornstein, Andreas, Per Krusell, and Giovanni Violante. 2011. "Frictional Wage Dispersion in Search Models: A Quantitative Assessment." *American Economic Review* 101 (7):2873–98.
- Houseman, Susan, Arne Kalleberg, and George Erickcek. 2003. "The Role of Temporary Agency Employment in Tight Labor Markets." *ILR Review* 57 (1):105–127.
- Katz, Lawrence. 1986. "Efficiency Wage Theories: A Partial Evaluation." *NBER Macroeconomics Annual* 1:235–276.
- . 2017. "Interview with Lawrence Katz." *Interview by Douglas Clement, Federal Reserve Bank of Minneapolis* .
- Katz, Lawrence and Alan Krueger. 2018. "The Rise and Nature of Alternative Work Arrangements in the United States, 1995-2015." *ILR Review* .



- . 2019. “Understanding Trends in Alternative Work Arrangements in the United States.” *NBER Working Paper*: <https://www.nber.org/papers/w25425> .
- Kline, Patrick, Neviana Petkova, Heidi Williams, and Owen Zidar. 2019. “Who Profits From Patents? Rent-Sharing at Innovative Firms.” *The Quarterly Journal of Economics* 134 (3):1343–1404.
- Kline, Patrick, Raffaele Saggio, and Mikkel Sølvsten. 2019. “Leave-Out Estimation of Variance Components.” *NBER Working Paper No. w26244* .
- Krueger, Alan and Lawrence Summers. 1988. “Efficiency Wages and the Inter-Industry Wage Structure.” *Econometrica* :259–293.
- Lester, Richard. 1967. “Pay Differentials by Size of Establishment.” *Industrial Relations: A Journal of Economy and Society* 7 (1):57–67.
- Mas, Alexandre and Amanda Pallais. forthcoming. “Alternative Work Arrangements.” *Annual Review of Economics* .
- Mortensen, Dale. 2003. *Wage Dispersion: Why are Similar Workers Paid Differently?* MIT press.
- OECD/IDB EPL Database. 2015. “Employment Policies and Data: Argentina.” .
- Saez, Emmanuel, Benjamin Schoefer, and David Seim. 2019. “Payroll Taxes, Firm Behavior, and Rent Sharing: Evidence From a Young Workers’ Tax Cut in Sweden.” *American Economic Review* 109 (5):1717–63.
- Slichter, Sumner. 1950. “Notes on the Structure of Wages.” *The Review of Economics and Statistics* :80–91.
- Tortarolo, Dario. 2019. “It Takes Two to Tango: Labor Responses to an Income Tax Holiday in Argentina.” *Working Paper* .
- Weil, David. 2014. *The Fissured Workplace*. Harvard University Press.

## 6 Figures

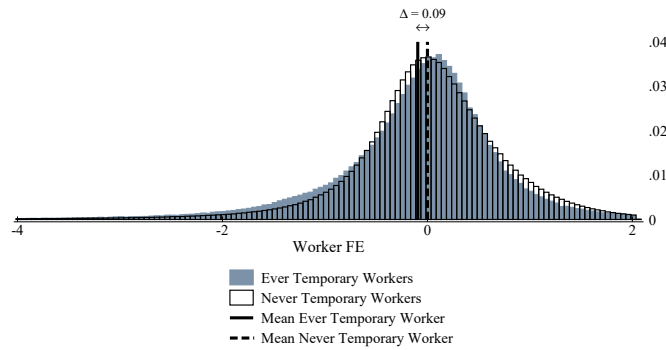
Figure 1: Measurement Challenges: Regular and Temp Agency Work Arrangements



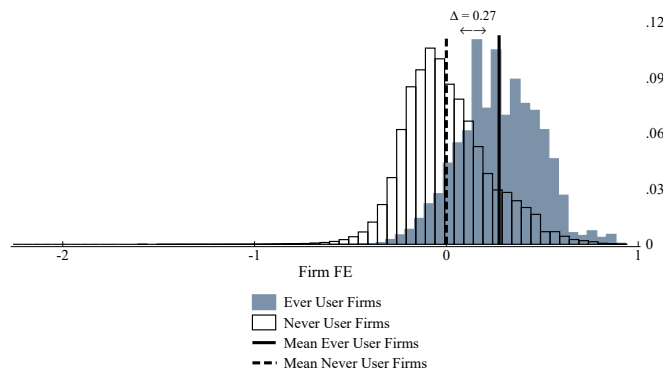
*Note:* The figure illustrates regular and temp agency work arrangements and their measurement in administrative data. Panel (a) plots regular work arrangements in which employer and workplace typically coincide. Panel (b) illustrates the case of temp agency work arrangements in which a temp agency serves as the employer while the user firm is the actual workplace. The links between user firms are generally not observed in matched employer-employee datasets (Panel (c)), as no direct contractual links exist between the user firm and the temp agency worker. Panel (d) illustrates the case of Argentinian matched employer-employee data, which allow us to observe links between user firms and temp agency workers due to dual registration.

Figure 2: Worker and Firm AKM Effects For Regular Workers and Temp Agency Workers, and By Work Arrangements

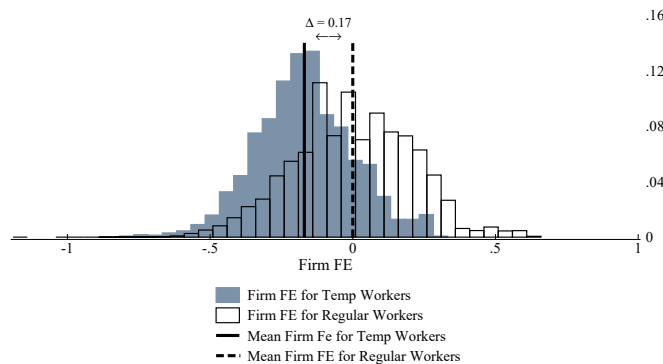
(a) Worker Effects: Never- and Ever-Temp Agency Workers



(b) Regular Work Arrangement Firm Effects of User and Non-User Firms

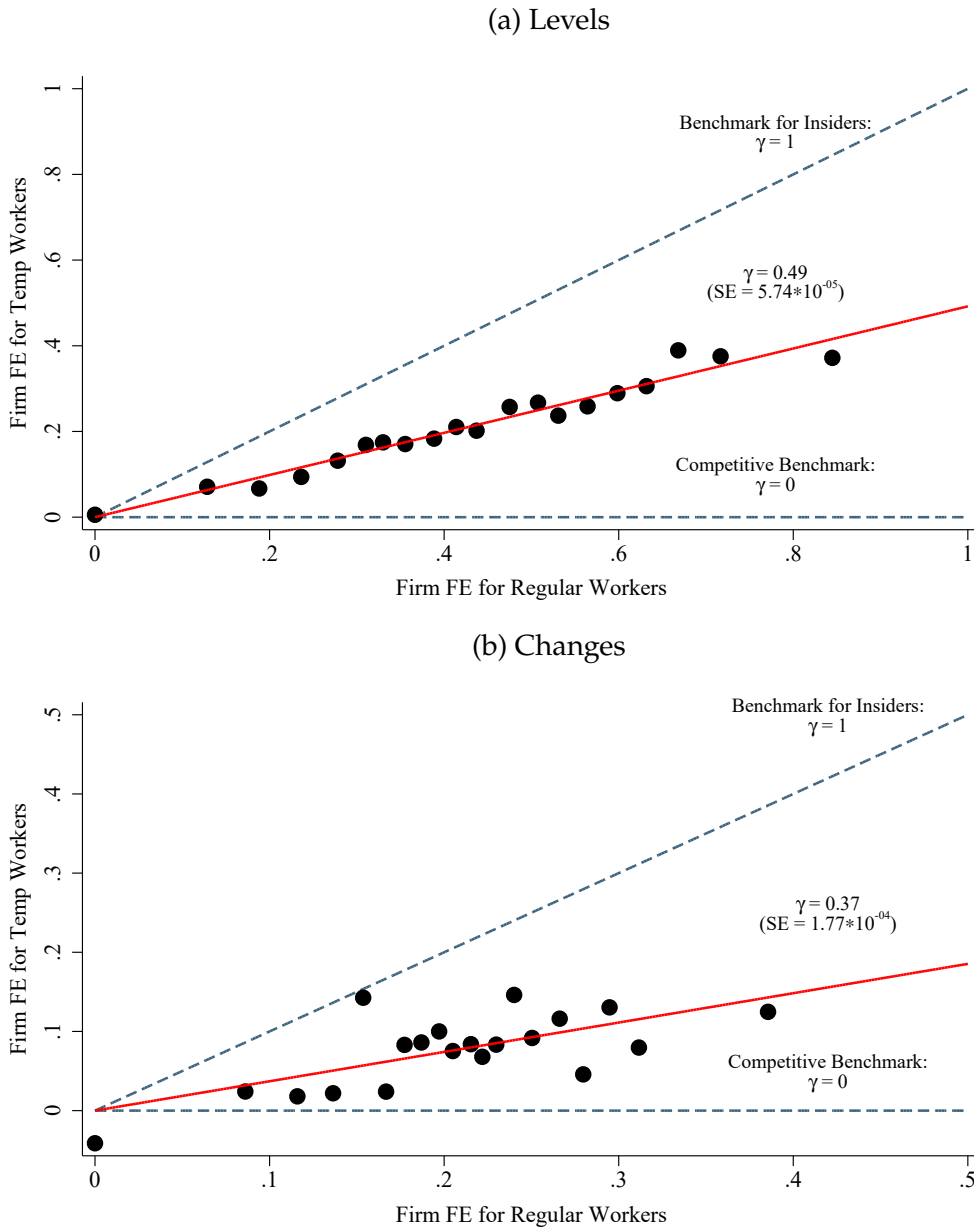


(c) Firm Effects, by Regular and Temporary Agency Work Arrangement (for Ever-User Firms)



Note: The figures report histograms of AKM worker and workplace effects. Panel (a) studies selection of workers into temp agency work and plots histograms of AKM worker effects for workers who were ever or never employed in a temp agency work arrangement. The histograms overlap substantially, although the mean worker effect is 9 log points lower for workers ever employed in a temp agency arrangement, i.e., indicating negative selection into becoming a temp agency worker. Panel (b) studies selection of firms into outsourcing labor (i.e., becoming a user firm of temp agency workers). It plots the histogram of AKM firm effects for regular work arrangements, separately for firms that were ever or never hired through temp agency arrangements in our observation period. The distribution for user firms is shifted to the right by 27 log points, indicating that firms with higher wage policies for regular workers are more likely to have outsourced labor. Finally, panel (c) juxtaposes the workplace pay premia in temp agency and regular work arrangements *within the same workplace* as it draws on the sample of user firms. The histograms indicate 17 log points higher workplace pay premia in regular work arrangements.

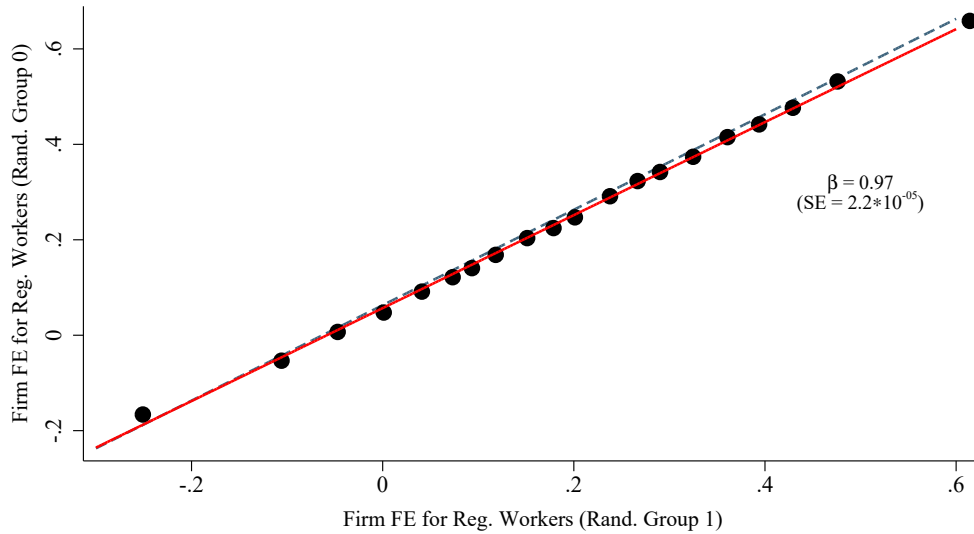
Figure 3: Estimated Firm Effects for Temp Agency and Regular Work Arrangements



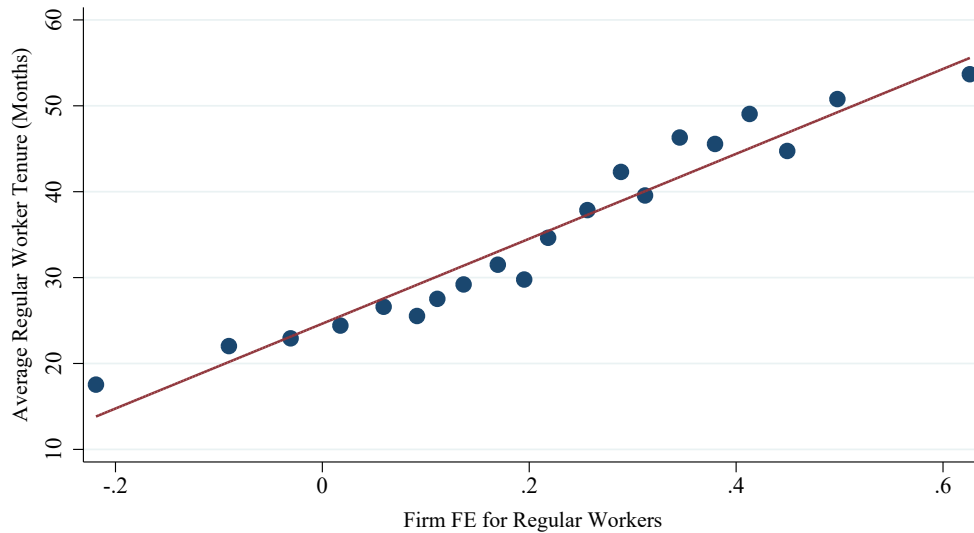
Note: The figure shows a binned scatter plot of estimated firm effects for firms acting as user firms for temp agency workers,  $\psi_{j,t}^T$ , plotted against firm effects in regular work arrangements,  $\psi_{j,t}^R$ . Panel (a) does so for a cross-sectional comparison using all years (slope 0.490; SE  $5.74 \cdot 10^{-5}$ ); Panel (b) plots the changes in the fixed effects, splitting the data in two period windows, from 2009 to 2013 and from 2014 to 2017 (slope 0.37; SE  $1.77 \cdot 10^{-4}$ ). For ease of visualization, we normalize the respective *levels* of the fixed effects in the lowest respective vintiles to zero. This normalization is inconsequential for our estimation of the *slope*,  $\gamma$ , and would be absorbed by the intercept. Estimated firm effects are restricted to those firms in the largest connected set that, at any point in our sampling window, served as the workplace of temp agency workers. The red regression line corresponds to the OLS regression line following specification (3).

Figure 4: Average Tenure vs Regular Firm Fixed Effects

(a) Relationship Between AKM Firm FEs for Regular Workers in Two Random Samples (First Stage of Split-Sample IV)



(b) Average Tenure vs. Regular Firm Fixed Effects



Note: Panel (a) shows a split-sample specification with AKM firm effects for regular workers estimated based on two different 50% samples of workers. The slope of the relationship is 0.974 (SE  $2.2 \cdot 10^{-5}$ ,  $R^2 = 0.9348$ ). Panel (b) shows a binned scatter plot of estimated firm effects for firms acting in regular work arrangements,  $\psi_j^R$ , plotted against the average tenure, in months, of workers under regular work arrangements at the firm (slope 40.7; SE 0.002). Estimated firm effects are restricted to those firms in the largest connected set that, at any point in our sampling window, served as the workplace of temp agency workers.

## 7 Table

Table 1: Temp Agency Work Arrangement Pay Penalty

	Outcome: Log Wage					
	(1)	(2)	(3)	(4)	(5)	(6)
Temp Agency Arrangement	-0.133*** (0.000523)	-0.0745*** (0.00132)	-0.191*** (0.00123)	-0.193*** (0.00123)	-0.0795*** (0.000487)	-0.140*** (0.000485)
Year	Yes	Yes	Yes	Yes	Yes	Yes
Gender	No	Yes	Yes	Yes	Yes	Yes
Age Cubic	No	Yes	Yes	Yes	Yes	Yes
Industry FE	No	No	Yes	Yes	Yes	No
Industry - Year FE	No	No	No	Yes	No	No
Worker FE	No	No	No	No	Yes	Yes
Firm FE	No	No	No	No	No	Yes
R-Squared	0.011	0.070	0.352	0.355	0.897	0.922
Observations	52,167,733	49,580,782	49,561,798	49,561,794	48,463,435	48,419,633

*Note:* The table reports coefficients for the temp agency arrangement pay penalty  $\rho$  in Mincer equations following regression specification (1). Standard errors clustered at the individual level reported in parentheses. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

## **Online Appendix:**

### **Paying Outsourced Labor:**

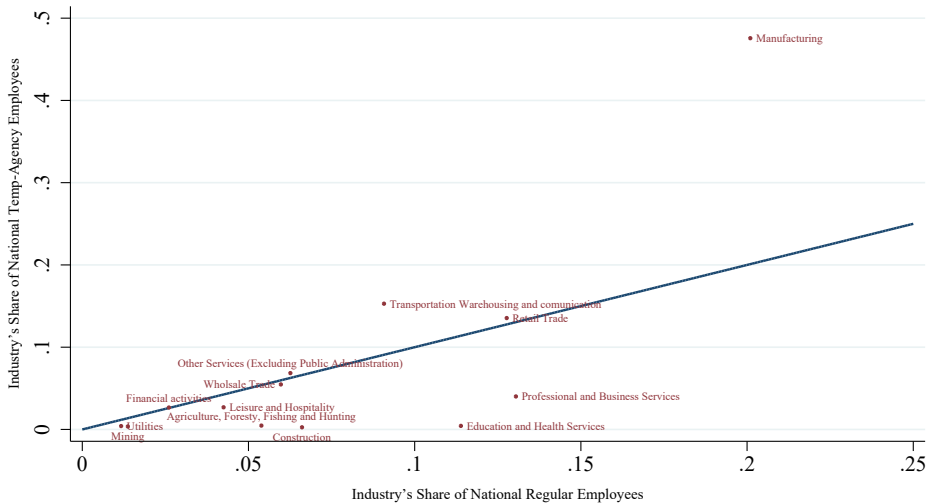
**Direct Evidence from Linked Temp Agency-Worker-Client Data**

Andres Drenik, Simon Jäger, Pascuel Plotkin, and Benjamin Schoefer

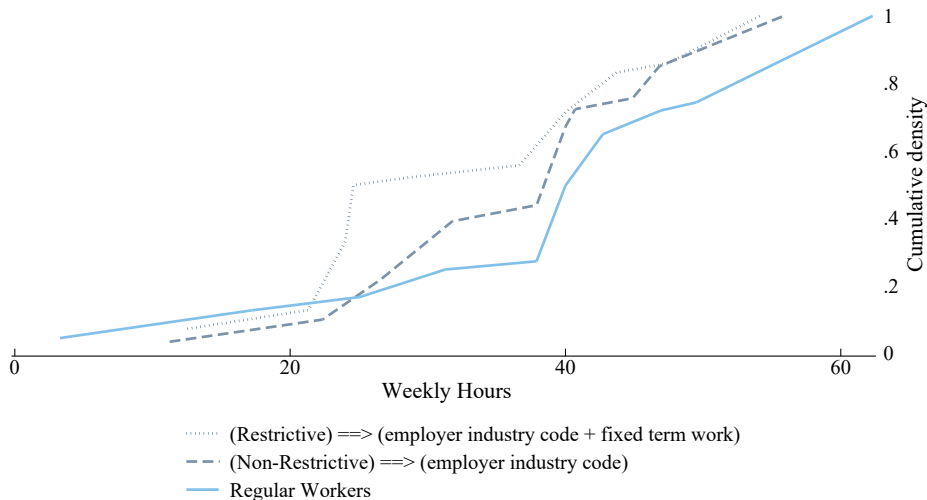
# A Appendix Figures

Figure A.1: Industry Distribution and Hours of Work of Temp Agency and Regular Workers

(a) Industry Distribution of Temp Agency and Regular Employment



(b) Temporary and Regular Workers' Average Weekly Hours

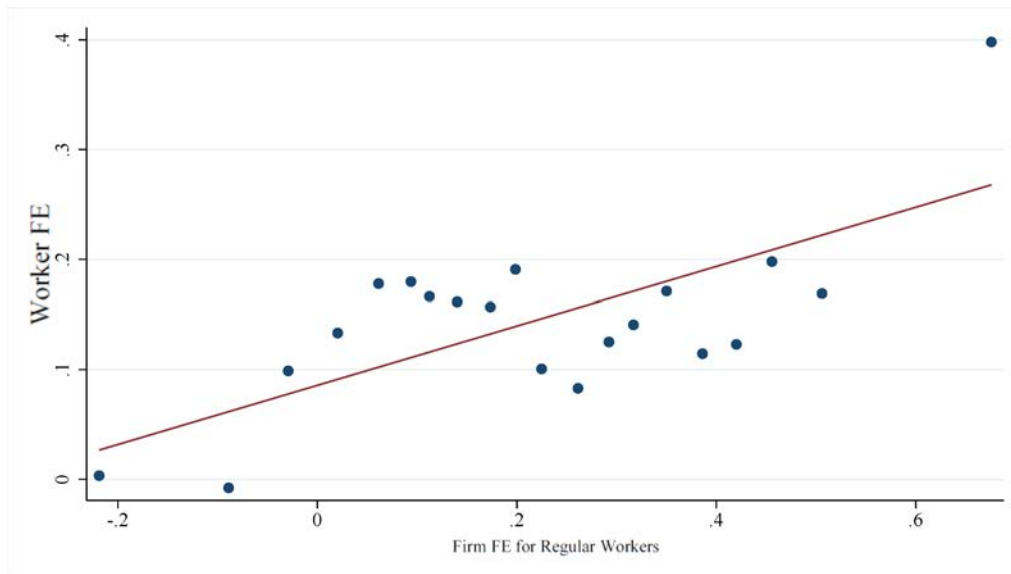


Note: Panel (a) plots the share of national temp agency employment enlisted in an industry against that industry's share of regular employment. Panel (b) plots temporary and regular workers' average weekly hours, as reported in the continuous labor force survey (*Encuesta Permanente de Hogares*) for the years 2011 to 2018. We draw on two definitions of temp agency work, available based on industry codes from 2011 onward. First, we plot the CDF of weekly hours when defining temp agency workers by their 2-digit industry code (mean 34.12; SE 13.16). Second, we show the CDF of weekly hours for temp agency workers defined by their 2-digit industry code and declaring working for a fixed period of time (mean 36.18; SE 12.15). As a benchmark, we also plot the CDF of hours for regular workers (mean 35.61; SE 16.50). The sample is restricted to workers who declared working less than 80 hours per week.

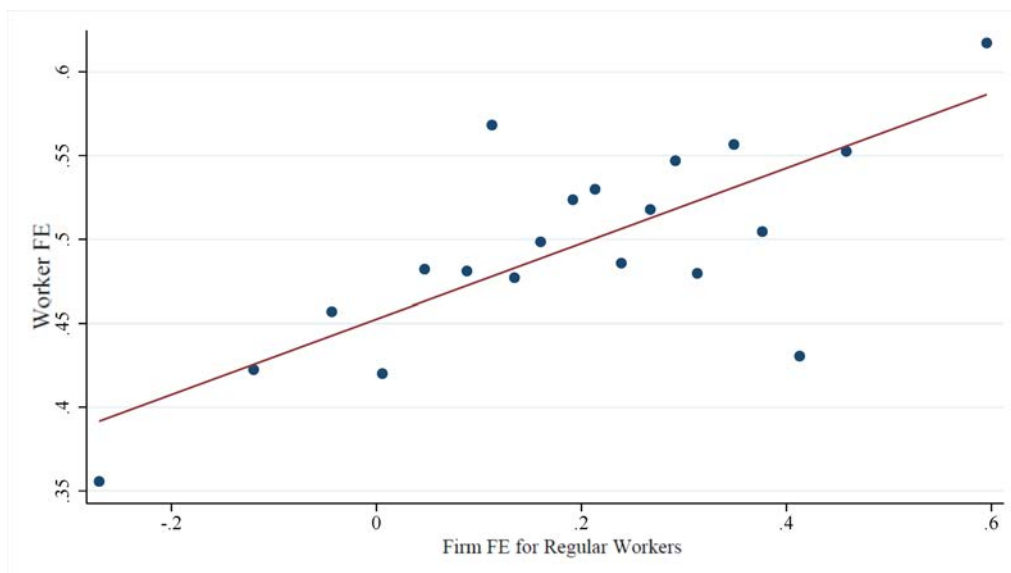


Figure A.2: Sorting of Regular and Temp Agency Workers: Estimated Worker Effects Against Firm Effects (by Work Arrangement)

(a) Regular Workers

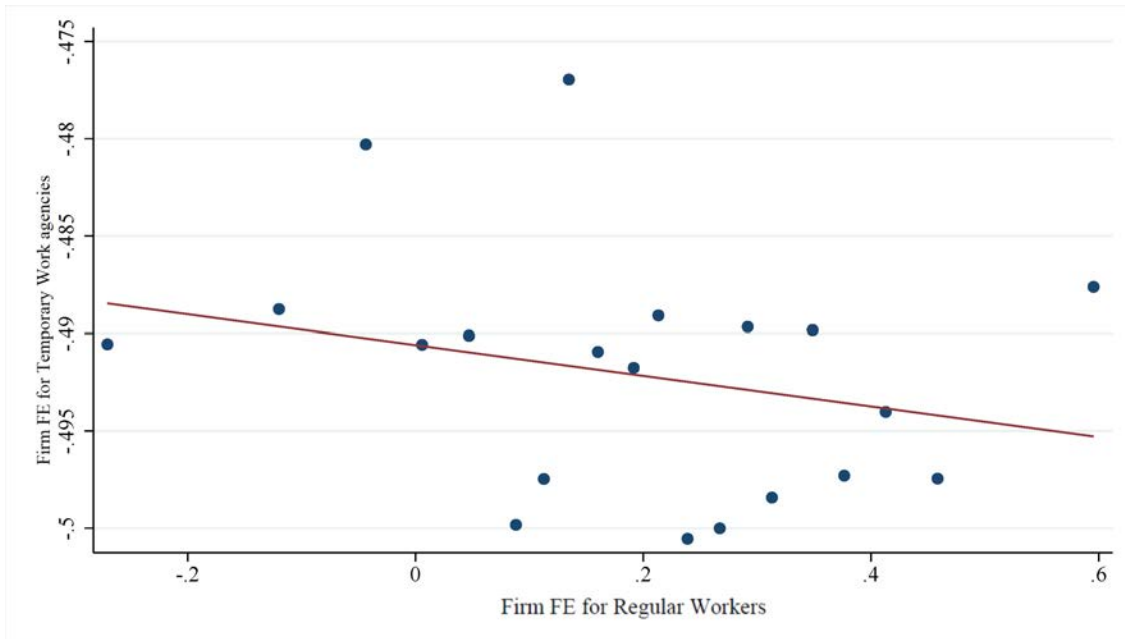


(b) Temp Workers



Note: The figure shows a binned scatter plot of estimated worker effects plotted against estimated firm effects in regular work arrangements,  $\psi_j^R$ . Panel (a) plots the estimated worker effects for workers who are never temporary workers against firm fixed effects under regular work arrangements (slope 0.27; SE 0.002). Panel (b) plots the estimated worker effects for workers who are, at some point in our sample, working under a temporary agency work arrangement with firm fixed effects under regular work arrangements (slope 0.22; SE 0.002).

Figure A.3: Sorting in the Temporary Agency Market: Temporary Firm Fixed Effects Against Regular Firm Fixed Effects



Note: This figure shows a binned scatter plot of estimated firm effects for temporary agency firms,  $\xi_{TA_{i,t}}^{\text{TempAgency}}$ , plotted against the estimated firm effects for regular work arrangements,  $\psi_j^R$ . The slope is -0.007 (SE 0.0001). The estimated firm effects of regular work arrangements are restricted to those firms in the largest connected set that, at any point in our sampling window, served as the workplace of temp agency workers.

## B Appendix Tables

Table A.1: Summary Statistics: All Formal Employees

	SIPA Dataset			US Survey (Katz & Krueger)		
	Years			Unweight.	Weight.	Alt. Weight
	2011	2014	2017	2015		
(Average for all registered workers during each year)						
Median Age (years)	34	35	36	50	41	41
Mean Age (years)	37	38	38	48.3	42.6	42.5
Median Wage (dollars)	891	925	952			
Mean Wage (dollars)	1,221	1,234	1,261			
Female (percent)	29.7	30.4	30.9	55.5	47.1	47.1
Multiple Jobholder	3.0	3.1	3.3	14.3	13.2	13.1
In Labor Force (Percent of Population)	46.3	44.9	45.9	62.8	67.5	67.5
Part-Time Employment	11.1	12.1	13.4	26.2	24.2	23.5
<b>Industry (percent):</b>						
Agriculture, Forestry, Fishing and Hunting	5.9	5.5	5.3	1.0	1.6	1.5
Mining	1.2	1.4	1.3	0.6	0.5	0.5
Utilities	1.0	1.1	1.2	0.5	0.9	0.9
Construction	7.2	6.8	7.0	3.1	4.1	3.9
Manufacturing	20.6	20.5	19.3	7.3	8.6	8.8
Wholesale Trade	5.8	5.8	5.9	2.6	2.2	2.2
Retail Trade	12.1	12.4	12.7	8.7	9.6	9.6
Transportation Warehousing and communication	8.6	8.9	8.9	6.4	9	9.2
Financial activities	2.5	2.6	2.6	9.2	9.2	9.2
Professional and Business Services	13.5	12.9	12.9	14.5	13.4	13.2
Education and Health Services	10.0	10.7	11.5	26.0	22.4	22.5
Leisure and Hospitality	3.9	4.1	4.3	5.4	6.0	6.0
Other Services (Excluding Public Administration)	4.9	4.9	5.0	5.2	4.8	4.7
Temporary work agents	1.6	1.1	0.8		1.6	1.6
<b>Avg. Workers</b>	4,225,916	4,261,083	4,296,090			

Note: SIPA summary statistics are for the overall (rather than final regression) sample using SIPA administrative data (described in the main text). The right columns report summary statistics for the US labor market computed by Katz and Krueger (2018) based on survey data.

Table A.2: Summary Statistics: All Temporary Work Agents in User Firms (SIPA-Registro Version)

	SIPA Dataset			US Survey (Katz & Krueger)		
	2011	2015	2017	CPS 2005	Weighted 2015	Alt. Weight 2015
(Average for workers in user firms during each year)						
Median Age (years)	26	26	26	44	47	45
Mean Age (years)	28	28	28	44.0	46.8	46.5
Median Wage (dollars)	696	682	752			
Mean Wage (dollars)	741	745	808			
Female (percent)	22.6	21.2	20.6	38.6	50.4	50.8
Multiple Jobholder	10.2	8.9	9.1	7.4	32.0	33.0
Part-Time Employment	3.0	2.5	3.8	35.2	47.7	46.2
<b>Industry (percent):</b>						
Agriculture, Forestry, Fishing and Hunting	0.5	0.3	0.5	1.5	4.4	4.1
Mining	0.7	0.5	0.4	0.3	0.5	0.5
Utilities	0.3	0.3	0.4	0.5	0.3	0.4
Construction	0.4	0.3	0.4	18.0	7.0	6.7
Manufacturing	49.7	44.6	44.0	4.7	5.9	6.2
Wholesale Trade	5.2	4.6	5.3	2.3	0.6	0.7
Retail Trade	12.6	11.4	12.5	7.1	6.3	6.4
Transportation Warehousing and communication	11.0	11.8	16.6	6.4	9.0	9.2
Financial activities	2.6	2.2	1.8	7.8	6.4	6.2
Professional and Business Services	4.9	4.4	4.1	23.4	20.7	20.6
Education and Health Services	0.3	0.4	0.5	13.9	21.9	22.3
Leisure and Hospitality	1.7	1.9	3.0	5.1	4.7	4.6
Other Services (Excluding Public Administration)	3.7	5.8	7.9	7.7	7.4	7.1
<b>Avg. Workers</b>	40,227	20,981	21,227			

Note: SIPA summary statistics are for the overall (rather than final regression) sample using SIPA administrative data (described in the main text). The right columns report summary statistics for the US labor market computed by Katz and Krueger (2018) based on survey data.