

# Paying Outsourced Labor:

## 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 with unique, Argentinian administrative data featuring 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 arrange-

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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.

ments 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 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 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 through 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-rent 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

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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.

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%. Moreover, 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 and quantitatively similar results when correcting for measurement error. 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). Finally, this pass-through, of around one half, is present even in low tenure cells of the labor market, where regular workers are more comparable to temp workers, as well as in firms less or more subject to wage floors from the national minimum wage or collectively bargained wage floors.

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). **For example, Argentine law (Decreto 1694/2006) mandates that temp agency workers should be treated no worse than regular workers in the same capacity, similar to provisions in the European Union’s Temporary Agency Work Directive 2008.** Finally, about 1.5% of employees were employed 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; if anything, temporary workers appear to work slightly more hours (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.

**Wage Setting in Argentina** The Argentinian labor market features substantial scope for firm-level wage setting, consistent with the dispersion in between-firm wages we will document. First, the minimum wage is not very binding in Argentina, with more than 99% and 94% of formal workers having wages above the minimum wage in 2003 and 2012, respectively (Bértola and Williamson, 2017). Second, sector-wide collective bargaining agreements (CBAs) specify wage floors by occupation for all employers. Third, some firm-specific CBAs are negotiated by the trade union with large firms that must weakly deviate upwards. Fourth, specific employers can always deviate upwards on a discretionary basis.

Consistent with this scope for firm-level wage setting, although more than 80% of formal employees are covered by CBAs, in the mid 2000s, the average monthly wage in the formal sector was 23% higher than the average monthly wage stipulated by sector-wide CBAs (see Palomino and Trajtemberg, 2006).

**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 (by omitting the first and last month of employment in each job spell, as we do not observe precise start dates of the temp agency-client firm 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. Our data set does not contain information on hours, but in Section 2, supplementary data suggested that hours are if anything higher among temp workers, making it unlikely that hours differences explain lower earnings.

**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*. The coefficient of interest will capture pay premia differences between regular and temp agency work arrangements, but may also pick up potential differences in hours or productivity between arrangements (the former of which we can rule out on average as we noted above). We estimate (1) based on the procedure in Correia (2017) and cluster standard errors at the worker level.

We report results for specification (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 and find a larger temp penalty of -0.140 (SE 0.0005). Overall, the estimated wage penalty of -0.140, controlling for workplace and worker effects, is similar to the estimates from the event studies of outsourcing of low-skilled service workers in Germany (-15 to -10 percent, see Goldschmidt and Schmieder, 2017) and for janitors and

security guards in the US (-24 to -4 percent, see Dube and Kaplan, 2010).

**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>3</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  $t$ . The temp agency fixed effects also absorb potential average differences between work arrangements, such as potential differences in productivity or hours. We include as control variables,  $X_{it}$ , a cubic term in worker age and year fixed effects. Intuitively, the wage changes of movers between different workplaces and work arrangements identify the fixed effects.<sup>4</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

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<sup>3</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. We deviate by estimating the model simultaneously for both work arrangements; our temp-agency fixed effects hence absorb, e.g., average differences between the arrangements.

<sup>4</sup>Since we include temp agency fixed effects and workplace effects, our estimates are identified off firms with multiple connections within a connected set.

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. That is, 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 relating AKM worker effects for the two types of workers to firms' (regular) AKM pay premia in Appendix Figure A.2. We find positive slopes of 0.27 for regular workers and only somewhat lower at 0.22 for temp agency workers. This assortative matching, which amplifies between-firm wage dispersion, may reflect temp agencies assigning their most productive workers to their most productive clients, or high-wage temp workers may obtain the best-paying assignments. By contrast, we do not find that high-wage firms hire from high-wage temp agencies. Here, we find a flat slope of -0.007 (Appendix Figure A.3).

**Between-firm Dispersion in Pay Policies for Regular and Temp Workers** Most importantly 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. 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.<sup>5</sup> 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 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

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<sup>5</sup>Instead weighting firm observations by the number of temporary workers (rather than all workers) would yield a weighted-mean difference of 0.13, akin to the relative wage-setting effect in the terminology of Card, Cardoso, and Kline (2016) in the context of the gender wage gap, suggesting that temporary workers are more likely to work for firms that pay relatively high wages to temporary workers.

<sup>6</sup>Specifically, we split our sample of workers into two random groups 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.

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 monthly observations. Panel (a) indicates that the empirical pay premia trace out a slope of  $\gamma^{OLS} = 0.490$  (SE 0.0075). 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

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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.

to extend their pay premia to outsourced labor, but only pass on half the amount.<sup>8</sup>

**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 0.0077). 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 Appendix Figure A.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 0.029,  $R^2 = 0.9348$ ) 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 0.0077) 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.

**Do High-Wage Firms Offer Better Jobs?** We additionally assess whether high-wage firms offer better jobs by studying the cross-sectional relationship between tenure and pay

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<sup>8</sup>Instead weighting firm observations by the number of temporary workers (rather than all workers) would yield a slightly higher slope of 0.61 (SE 0.0055), suggesting that temporary workers are more likely to work for firms that share more rents with temporary workers, also consistent with our finding of a lower average pay gap in that weighting scheme summarized in Footnote 5.

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 Appendix Figure A.4 Panel (b). Quantitatively, a 10% higher AKM pay premium for regular workers is associated with a 5 months longer tenure.<sup>9</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.

**Comparability of Temp and Regular Jobs** If pay premia only accrue to new hires once they become stably employed incumbents perhaps (as in Kline et al., 2019, who document differential rent sharing with new hires and incumbents) due to firm-specific human capital, or if pay compression operates within comparable jobs rather than across all worker types, then our pooled pay premium may downward bias the estimated slope.

To assess this concern, we separate our client firms into 4-digit industries with lower (below-median) and higher (above-median) average tenure for *regular* workers. We construct industry leave-out means rather than potentially endogenous firm-level tenure information.<sup>10</sup> We report those results in Figure 4 Panel (a), which replicates Figure 3 Panel (a) separately firms in high and for firms in low tenure industries. We find a *lower* slope of 0.45 in the sample of firms with below-median tenure, compared to a slope of 0.54 in firm with above-median tenure. That is, if, anything, pay premium sharing increases when temp and regular workers become more comparable in terms of tenure.

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<sup>9</sup>A 5-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.

<sup>10</sup>Our data does not contain occupation data. We construct the sample and industry means again weighted by worker counts.

**Institutional Constraints: Collective Bargaining and the Minimum Wage** To assess the role of CBA wage floors or the national minimum wage, we again split up our analysis sample along the median by three 4-digit-industry-level proxies reflecting the severity of these concerns. First, in Figure 4 Panel (b), we split up firms by the average dispersion (standard deviation) in regular-worker pay premia within the industry, reflecting that potential CBA wage floors or the minimum wage bind for fewer firms. Here, we find that firms with more scope for firm-level wage setting have a slightly larger slope (0.53 (SE 0.0085) compared to 0.48 (SE 0.0155) for below-median firms), suggesting that a mechanical pay premia pass-through in industries with more regulated pay is unlikely to explain our pattern of results.

Second, in Figure 4 Panel (c), we split firms by the average level of the AKM fixed effects. This measure proxies for the average distance from the minimum wage and for industry rents (e.g., Krueger and Summers, 1988). We find a slope of 0.46 (SE 0.0105) for the firms below the median, only slightly lower than the slope for above-median (high-wage) firms (0.54 (SE 0.0145)).

Third, as a direct measure of collective bargaining coverage, in Figure 4 Panel (d) we split the firms by the industry coverage of CBAs.<sup>11</sup> Here, we find that firms above and below the median exhibit *very similar* slopes (0.50 (SE 0.0154) and 0.51 (SE 0.0088), respectively). Overall, our findings likely reflect patterns that would arise in settings with large scope for firm-level wage setting and indeed reflect sharing of firm-specific rents.

## 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

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<sup>11</sup>We construct CBA coverage as the fraction of workers whose occupation has a CBA wage floor, on the basis of the worker-level flag in the SIPA data.

workplace-specific pay premium to temp workers. We close with plausible interpretations of our findings and a discussion of potential implications.<sup>12</sup>

**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 a firm’s rents 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 or double marginalization may lead the temp agency to appropriate some of the rents. 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, 1996; Houseman, Kalleberg, and Erickcek, 2003; Autor, 2003; Mas and Pallais, forthcoming, for existing evidence). Here, our findings suggest that 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

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<sup>12</sup>For this section, we also draw on informal interviews with temp agency representatives, for whose advice and clarifications we are grateful.

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 multiple of the temp worker's wage (e.g., about 1.5 to 2% based on conversations with leading temp agencies, and thus are small relative to the average wage gap and, as proportionate fees, do not affect the log-log slope we estimate).

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.

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, even though we suspect that similar forces may operate in jurisdictions with related provisions, such as in the European Union. 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.

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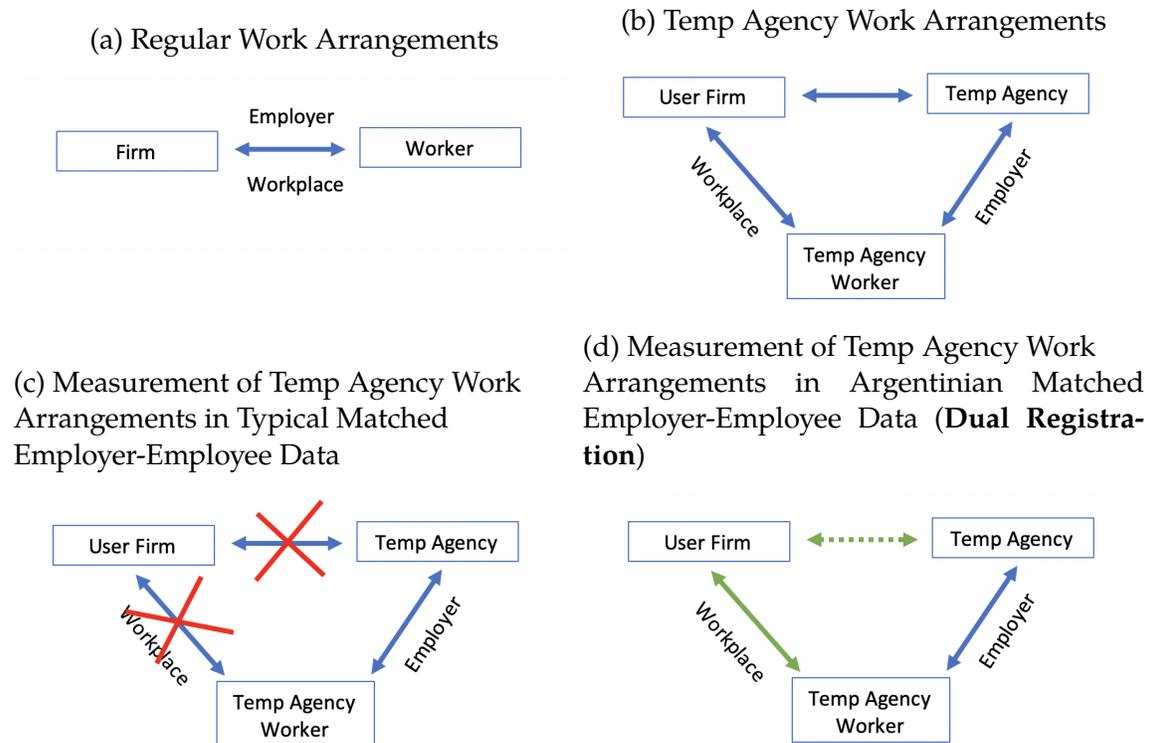
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## 6 Figures

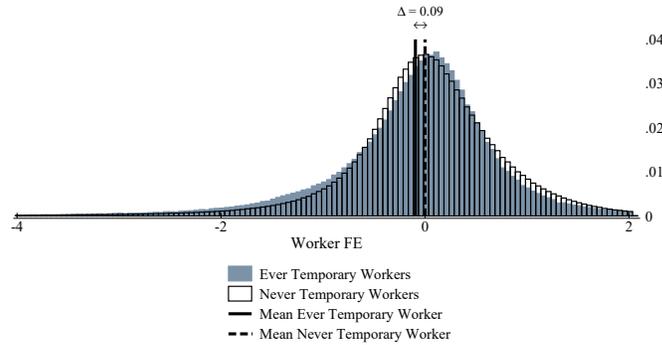
Figure 1: Measurement Challenges: Regular and Temp Agency Work Arrangements



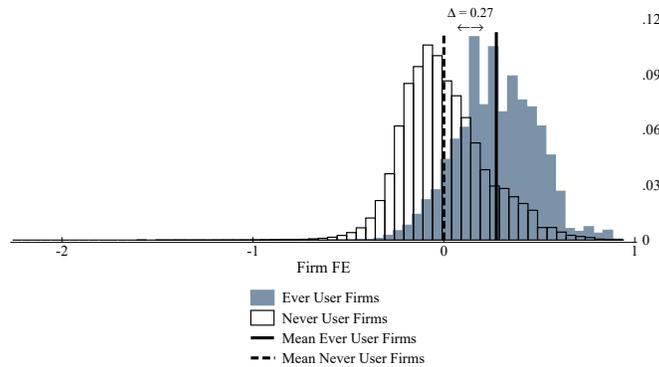
*Note:* The figure illustrates regular and temp agency work arrangements and their measurement in administrative data. Panel (a) plots regular work arrangements in which employer and workplace typically coincide. Panel (b) illustrates the case of temp agency work arrangements in which a temp agency serves 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 Pay Premia (AKM Effects) For Regular Workers and Temp Agency Workers, and By Work Arrangement

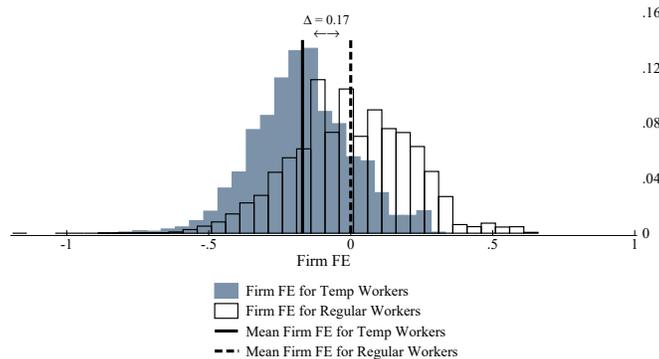
(a) Worker Effects: Never- and Ever-Temp Agency Workers



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

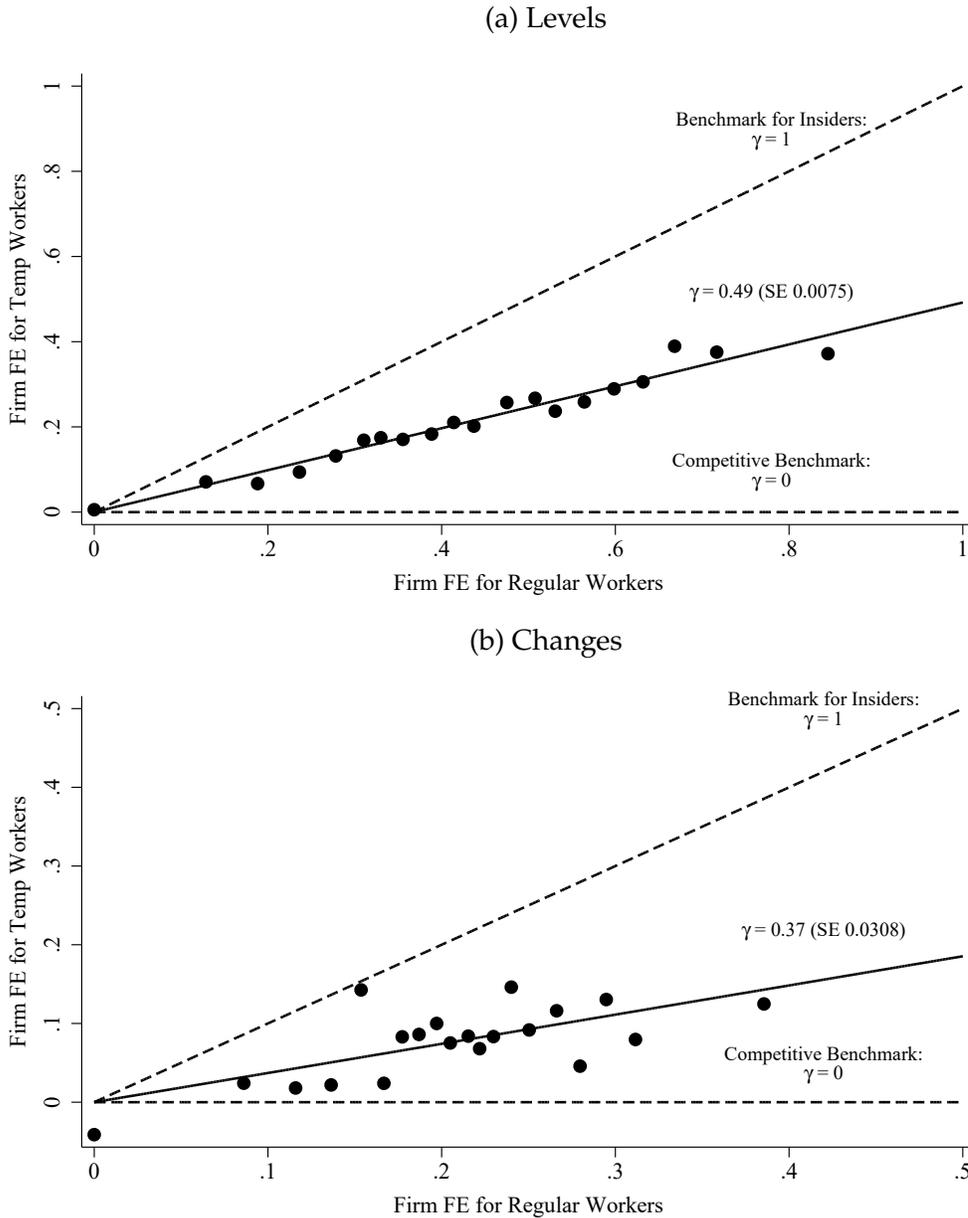


(c) Firm Effects, by Regular and Temporary Agency Work Arrangement (for Ever-User Firms)



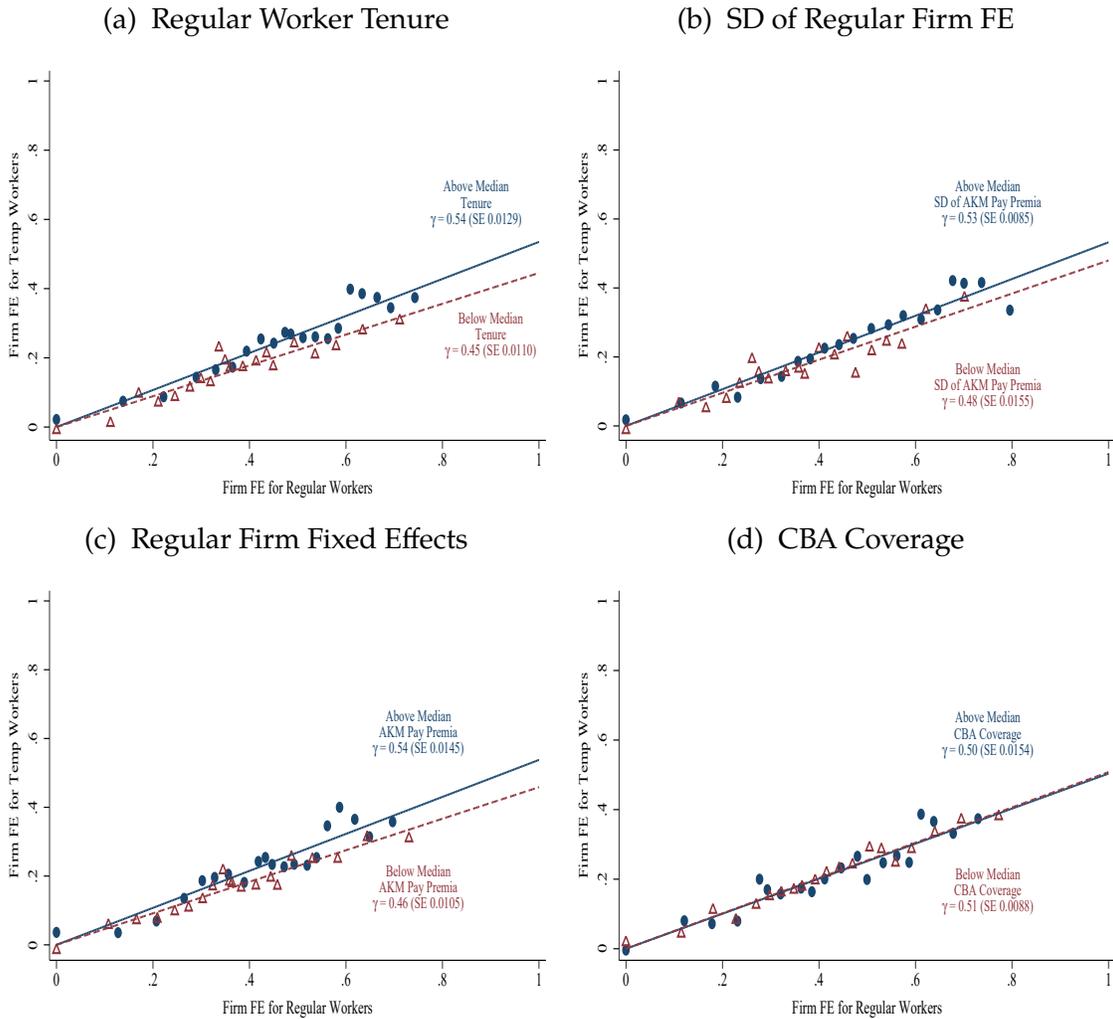
Note: The figures report histograms of AKM worker and workplace effects. Panel (a) studies selection of workers into temp agency work and plots histograms of AKM worker effects for workers who were ever or never employed in a temp agency work arrangement. The histograms overlap substantially, although 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: Firm-Level Pay Premia Sharing Between Workers in 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,  $\psi_J^T$ , plotted against firm effects in regular work arrangements,  $\psi_J^R$ . Panel (a) does so for a cross-sectional comparison using all years (slope 0.49; SE 0.0075); 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 0.0308). 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: Industry Heterogeneity in Firm-Level Pay Premia Sharing Between Workers in Temp Agency and Regular Work Arrangements



Note: This figure replicates our main result in Figure 3 Panel (a) separately for two halves of our analysis sample of temp agency user firms. For each variable, we construct a 4-digit leave-out industry mean (or standard deviation), weighting firms (in the analysis sample) by the worker count (consistent with our weighting in of the pooled analysis in Figure 3). We then sort our analysis sample based on the leave-out mean for each variable into one subsample above and one below median (again weighted by worker count), and estimate the specification (3) and generate the binned scatter plot in Figure 3 Panel (a) separately in each subsample. Panel (a) does so for regular-worker tenure (above median average tenure is 43 months and below median average tenure is 26 months), Panel(b) does so for the within-industry standard deviation of AKM firm fixed effects (above median average SD is 0.18 and below median average SD is 0.10), Panel (c) for the industry average of the AKM firm fixed effect (above median average fixed effects is 0.28 and below median average fixed effects is 0.12), and Panel (d) for the industry-level average of collective bargaining agreement coverage on the basis of worker-level (population) SIPA data (above median average share of covered workers is 0.72 and below median average share of covered workers is 0.58).

## 7 Table

Table 1: Temp Agency Work Arrangement Pay Penalty

|                         | Outcome: Log Wage       |                         |                        |                        |                          |                         |
|-------------------------|-------------------------|-------------------------|------------------------|------------------------|--------------------------|-------------------------|
|                         | (1)                     | (2)                     | (3)                    | (4)                    | (5)                      | (6)                     |
| Temp Agency Arrangement | -0.133***<br>(0.000523) | -0.0745***<br>(0.00132) | -0.191***<br>(0.00123) | -0.193***<br>(0.00123) | -0.0795***<br>(0.000487) | -0.140***<br>(0.000485) |
| Year                    | Yes                     | Yes                     | Yes                    | Yes                    | Yes                      | Yes                     |
| Gender                  | No                      | Yes                     | Yes                    | Yes                    | No                       | No                      |
| 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:**

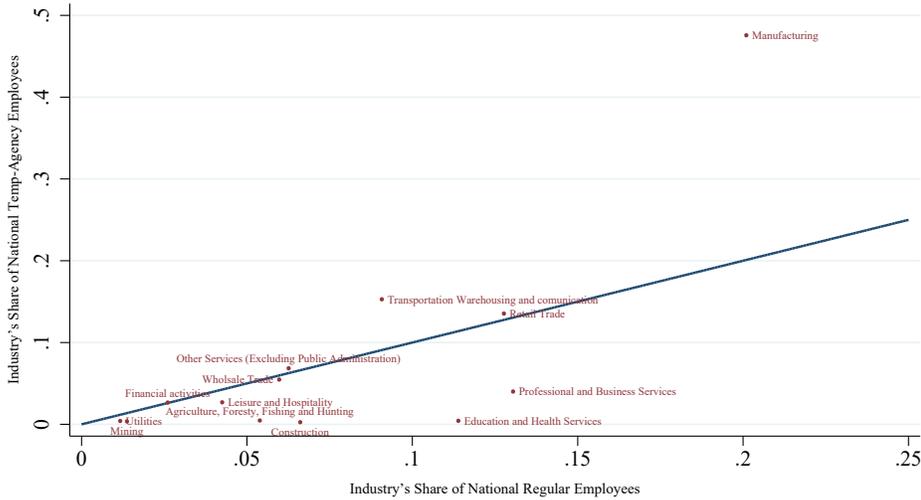
#### **Direct Evidence from Linked Temp Agency-Worker-Client Data**

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

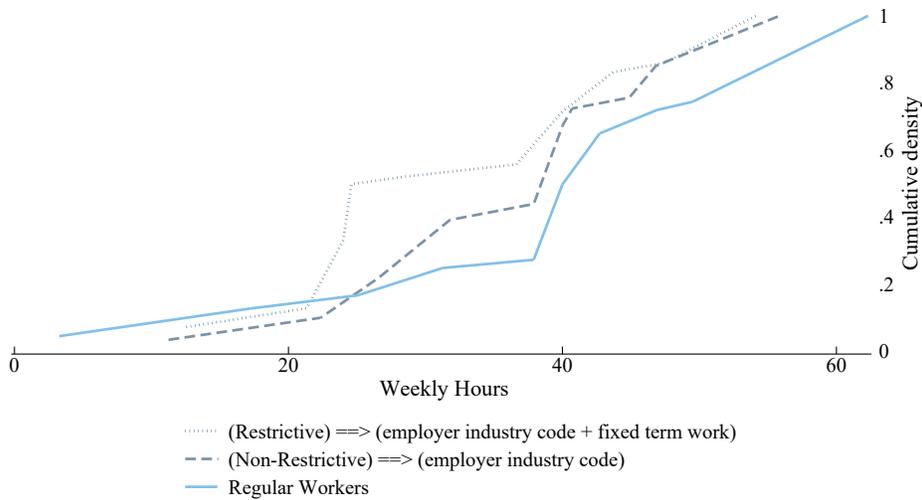
# A Appendix Figures

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

(a) Industry Distribution of Temp Agency and Regular Employment



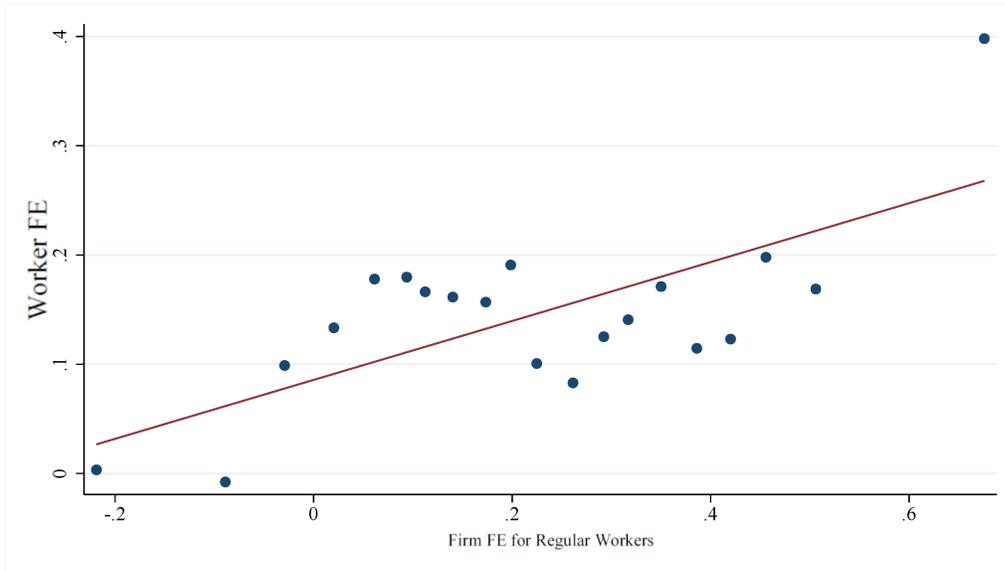
(b) Temporary and Regular Workers' Average Weekly Hours



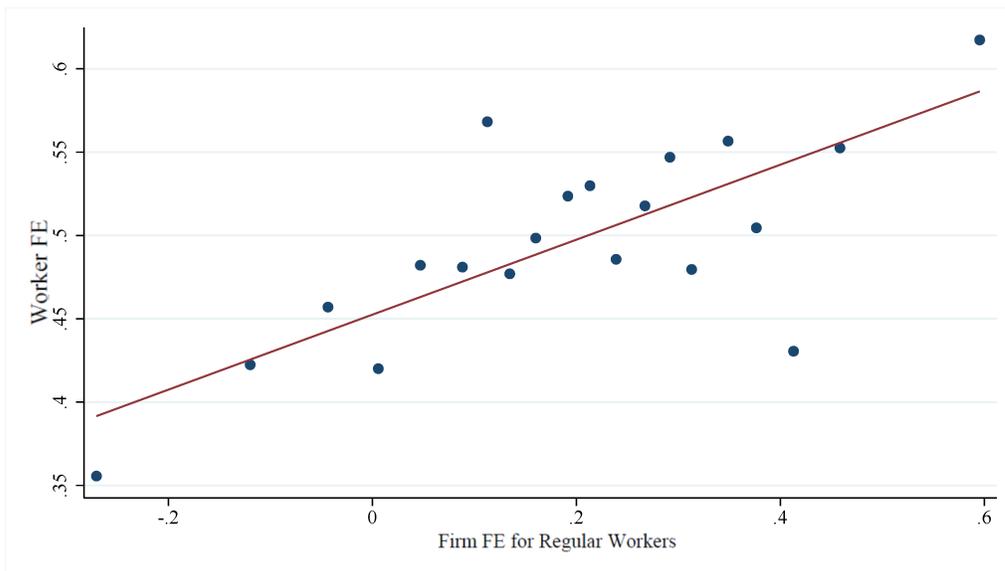
Note: Panel (a) plots the share of national temp agency employment enlisted in an industry against that industry's share of regular employment. Panel (b) plots temporary and regular workers' average weekly hours, as reported in the continuous labor force survey (*Encuesta Permanente de Hogares*) for 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

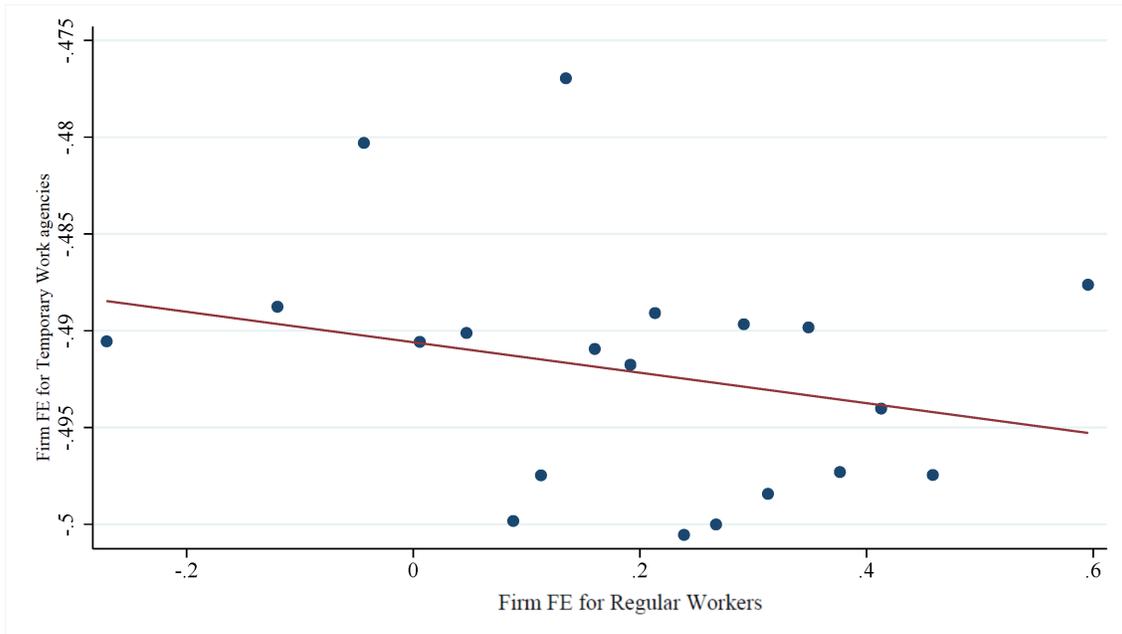


(b) Temp Workers



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 worker fixed effects for workers in regular work arrangement against firm fixed effects under regular work arrangements (slope 0.27; SE 0.002). Panel (b) does so for workers in temporary agency work arrangement with firm fixed effects under regular work arrangements (slope 0.22; SE 0.002).

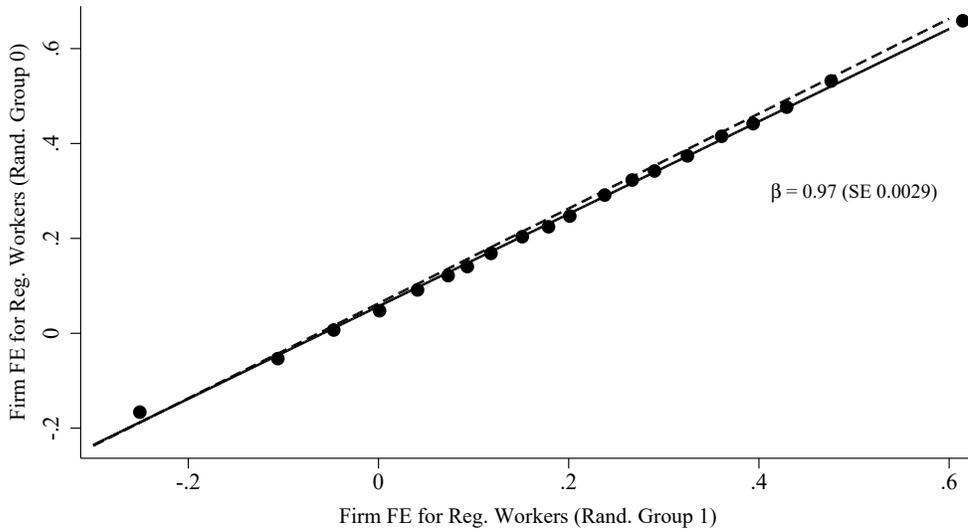
Figure A.3: Sorting in the Temporary Agency Market: Temporary Firm Fixed Effects Against Regular Firm Fixed Effects



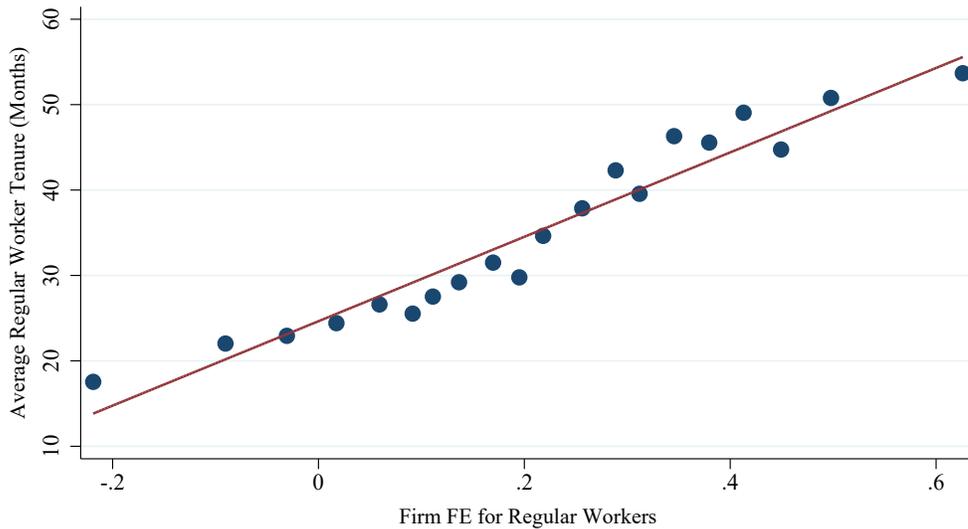
Note: This figure shows a binned scatter plot of estimated firm effects for temporary agency firms,  $\xi_{TA_{i,t}}^{\text{TempAgency}}$ , plotted against the estimated firm effects for regular work arrangements,  $\psi_j^R$ . The slope is -0.007 (SE 0.0001). The estimated firm effects of regular work 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.

Figure A.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 0.0029,  $R^2 = 0.9348$ ). 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 49.4; SE 0.691). 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.

## 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.