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 in temp agency work arrangements. We leverage unique Argentinian administrative data that feature links between user firms (the workplaces where temp workers perform their labor) and temp agencies (their formal employers). We estimate that a high-wage user firm that pays a regular worker a 10% premium pays a temp worker on average only a 4.9% premium, compared to what these workers would earn in a low-wage user firm in their respective work arrangements—the midpoint between the benchmarks for insiders (one) and the competitive spot-labor market (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 (defined as firm fixed effects in Abowd, Kramarz, and Margolis, 1999, henceforth AKM, specifications). 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 operating closer to a spot labor market or by lowering workers' bargaining power.[1] 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 compared to regular workers 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,

[1]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.

the user firm. This is true for surveys (Abraham and Amaya, 2018; Abraham et al., 2018; Katz and Krueger, 2018, 2019). And the challenge extends to typical administrative matched employer-employee datasets, which generally do not show links between temp agency workers and user firms (Goldschmidt and Schmieder, 2017, constitute an exemption as they circumvent the missing link problem by studying outsourcing events of clusters of workers in low-skilled service occupations). We illustrate this issue in Figure 1.

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). 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.[2]

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. User firm pay premia for

[2]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.

temp workers have a standard deviation of 17.2 log points, which rises to 20.7 log points in regular work arrangements for the same sample of user firms. Hence, the large degree of wage dispersion that characterizes regular work arrangements extends to the market for temporary agency work, even though this market is plausibly less subject to standard labor search frictions (consistent with Hornstein, Krusell, and Violante, 2011).

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 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. Normalizing the firm effects for both work arrangements to zero for the lowest wage user firms, 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 (zero).[3] This pass-through, of around one half, is present even in low-tenure industries, where regular workers are more comparable to temp workers, and in firms less or more subject to wage floors from the national minimum wage or collectively bargaining.

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.

[3] Temp workers' share of regular workers' pay premia would be even lower if even low-wage firms' premium is positive.

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 temp agencies in OECD countries (OECD/IDB EPL Database, 2015). For example, Argentinian 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 1.7% of employees were employed through a temp agency in 2005 (source: own calculations, using the employer industry code in SIPA, whereas all our subsequent identification uses the "SR" data set available from 2008 onward, 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. 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 from the sectoral agreements. 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). Details on the sample construction are in Online Appendix C. 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, reporting the monthly nominal pretax compensation paid by formal employers, to construct our earnings measures. 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 (1.5%) 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 the lower earnings we document below.

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, $\text{TempAgencyArrangement}_{it}$:

$$\ln w_{it} = \alpha_i + \psi_{J_{it}} + \rho \times \text{TempAgencyArrangement}_{it} + X'_{it}\beta + \epsilon_{it}. \tag{1}$$

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, α_i, which address selection based on permanent differences between workers. As a novel feature of our dataset, we also include workplace J fixed effects, $\psi_{J_{it}}$, 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:

$$\ln w_{it} = \alpha_i + \psi_{J_{it}}^{W_{it}} + \xi_{TA_{it}}^{\text{TempAgency}} + X_{it}'\beta + \epsilon_{it}, \tag{2}$$

where α_i are worker fixed effects and $\psi_{J_{it}}^{W_{it}}$ are work-arrangement-specific workplace effects.[4] The superscript $W_{it} \in R, T$ indicates whether worker i is employed through a temp agency (T) or a regular employment relationship (R) in period t, and J_{it} denotes the workplace. In addition, we include temp agency effects, $\xi_{TA_{it}}^{\text{TempAgency}}$, for the temp agency TA_{it} 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 in a connected set.[5]

[4]We estimate the model simultaneously for both work arrangements; our temp-agency fixed effects hence absorb, e.g., average differences between the arrangements.

[5]Card, Heining, and Kline (2013) suggest a test for the exogeneity of these moves based on the symmetry of wage changes of job switchers between firms ranked by coworker wages, which we leave for future research due to data access restrictions. The key test is for symmetry of temp wage changes between user

We estimate (2) in the largest connected set, which captures 60.8% of firms and 95.9% of worker-year-spell observations.

Which Firms Hire Temp Workers? In Panel (a) 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 obtaining 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 (b) of Figure 2, we plot the distribution of workplace effects for regular and temp work arrangements *in the sample of user firms*. The specification does not include temp agency fixed effects, so that we can directly compare the average workplace fixed effects

firms (ranked by temp coworker wages).

in regular and temp agency work arrangements.[6] The histogram, as in Panel (a), weights firm observations by total worker-month observations in order to give equal weight to similarly sized firms irrespective of the share of regular vs. temp workers.[7] The firms relying on temp labor are larger, as they make up 32.2% (1.6%) of our connected set sample of worker-month (total firms) observations. We find a downward shift in workplace effects for temp compared to regular work arrangements. The average pay premium is 17 log points lower for temp work arrangements compared with regular ones.[8]

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.[9] 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.

[6]Here, the difference may also capture average productivity or hours differences between the two arrangements besides true temp pay penalties.

[7]Moreover, unlike later in Figure 3, we do not normalize workplace fixed effects to zero for a baseline low-wage set of firms, but shift both distributions such that the mean of the regular workplace effects is zero.

[8]Instead weighting firm observations by the number of temporary (rather than all) workers yields 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 them higher wages.

[9]Specifically, we split our worker sample into two random groups and estimate the AKM specification (2) separately. We calculate the covariance of these two sets of fixed effects by work arrangement.

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

Our core specification compares the workplace pay premia earned by temp agency and regular workers in the same workplace. Their relationship 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, ψ_J^T, and compare them with those of their peers in regular employment relationships at the same workplace, ψ_J^R:

$$\psi_J^T = \alpha + \gamma \psi_J^R + \nu_J. \tag{3}$$

Our coefficient of interest is γ, capturing the elasticity of temp to regular pay premia. We estimate (3) with OLS.

We normalize ψ_J^T and ψ_J^R to zero in the lowest respective vigintiles for each work arrangement. This normalization is inconsequential for our estimation of the slope, γ, and is absorbed by the intercept. However, the normalization matters when interpreting γ as the parameter governing the fraction of the percent premia earned by regular workers that temp agency workers receive on average in higher-paying firms. If, for example, workers in regular work arrangements in low-paying firms do earn rents, but temp workers do not, then the estimate of γ constitutes an upper bound for the share of the premia earned by regular workers that temp workers receive on average (cf. Card, Cardoso, and Kline, 2016, for a similar argument related to gender wage gaps).

Polar Benchmarks: Law of One Price vs. Insiders We highlight two polar benchmarks for the slope γ. First, if firms' pay policies for outsourced workers mirror those for insiders in regular work arrangements, we expect $\gamma = 1$. This benchmark arises under similar degrees of rent sharing and rents to be shared, or institutional norms, formal or informal, curbing pay differentiation 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, we expect $\gamma = 0$.

Results We report binned scatter plots of ψ_J^T plotted against ψ_J^R in Figure 3. Panel (a) does so for levels, and Panel (b) for 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 is predicted to be 4.9%. Hence, firms do appear to extend their pay premia to outsourced labor, but only pass on half the amount.[10] Panel (b) broadly replicates these results by plotting the changes in the fixed effects within user firms over time, where we split the data in two period windows, from 2009 to 2013 and from 2014 to 2017. This specification holds, for instance, industry and region constant. We find a slope of 0.37 (SE 0.0308), perhaps smaller due to higher measurement error, but broadly consistent with our main results in Panel (a) for levels.

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 γ^{OLS}. The effects ψ_J^R are generated regressors such that the variance of ψ_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

[10]Instead weighting firm observations by the number of temporary (rather than all) workers yields 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 them, also consistent with our finding of a lower average pay gap in that weighting scheme summarized in Footnote 8.

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 and Online Appendix D for more information). We find a corrected coefficient of $\gamma^{IV} = 0.493$ (SE 0.0077). 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 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 5 months longer tenure.[11] 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 (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 in-

[11] A 5-month increase corresponds to about a 10% increase in tenure, so that the elasticity of tenure to pay premia is about one, consistent with Bassier, Dube, and Naidu (2019) based on US data.

formation.[12] 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 decreases when temp and regular workers become more comparable in terms of tenure.

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.[13] 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

[12]Our data do not contain occupation. We construct the sample and industry means again worker-weighted.

[13]We construct CBA coverage as the fraction of workers whose occupation has a CBA wage floor, using SIPA worker-level flags.

large scope for firm-level wage setting and indeed reflect sharing of firm-specific rents.

Heterogeneous Temp Penalties and Sorting Heterogeneous temp penalties across workers combined with assortative matching of temp workers to firms can lead our specification to underestimate the relative degree of rent sharing with temp workers. Specifically, if workers with high worker fixed effects sort into firms with high regular workplace effects (sidestepping sorting of workers into temp agencies, for which we include a set of fixed effects), and if the temp penalty increases in the worker fixed effect, then our estimated slope would also capture this effect. An alternative specification with separate worker fixed effects by work arrangement would remove these confounders. Our heterogeneity cuts in Figure 3 show, if anything, a smaller slope for industries with lower regular worker pay premia or with lower tenure for regular workers. Lastly, in Figure 4 Panel (b), we documented that changes in firms' wage policies result if anything in a lower slope.

5 Interpretation and Implications

We close with interpretations of our findings—that firms appear to pay at most half of the workplace-specific pay premia received by regular workers to temp workers—and a discussion of potential implications and also limitations of our design.[14]

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). Relatedly, three-party bargaining or double marginalization may lead the temp agency to appropriate some of the rents. Alternatively, temp agency labor supply

[14]Here, we also draw on interviews with temp agency representatives.

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 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.

Limitations Our study relies on AKM firm fixed effects to study firms' pay policies estimated separately for regular and temp work arrangements. Our preferred interpretation of such estimates concerns differential rent sharing patterns between the work arrangements. For data availability reasons, our analysis does not feature direct proxies for rents (such as labor productivity). Nor does our data set permit us to assess the comparability of the jobs performed by regular and temp workers. Future research may estimate regular workers' workplace fixed effects for those occupations that temp workers are performing in user firms, by merging additional data. Moreover, due to data access constraints, we are unable to conduct two specification and robustness checks: an exogeneity test of movers as in Card, Heining, and Kline (2013), and an alternative specification with worker fixed effects separated by work arrangement.[15]

[15] We thank a reviewer for suggesting these checks.

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* .

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* .

Bértola, Luis and Jeffrey Williamson. 2017. *Has Latin American Inequality Changed Direction?: Looking Over the Long Run*. Springer Nature.

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.

———. 2016. "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, Jörg Heining, and Patrick Kline. 2013. "Workplace Heterogeneity and the Rise of West German Wage Inequality." *The Quarterly Journal of Economics* 128 (3):967–1015.

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." .

Palomino, Héctor and David Trajtemberg. 2006. "Una nueva dinámica de las relaciones laborales yla negociación colectiva en la Argentina." *Revista de trabajo* 2 (3).

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.

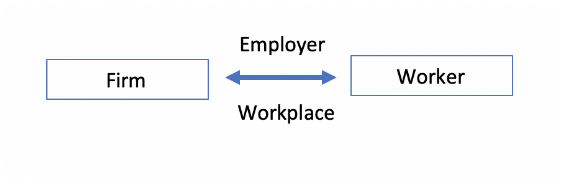
Tortarolo, Dario. 2019. “It Takes Two to Tango: Labor Responses to an Income Tax Holiday in Argentina.” *Working Paper* .

Weil, David. 2014. *The Fissured Workplace*. Harvard University Press.

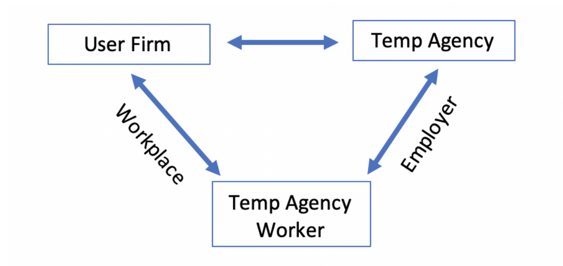
6 Figures

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

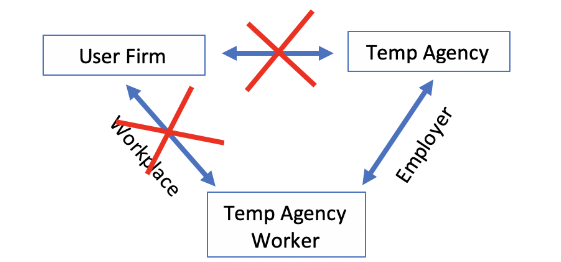
(a) Regular Work Arrangements



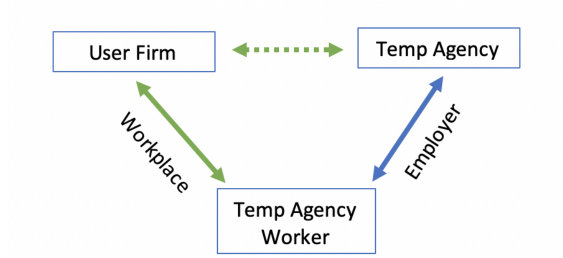
(b) Temp Agency Work Arrangements



(c) Measurement of Temp Agency Work Arrangements in Typical Matched Employer-Employee Data



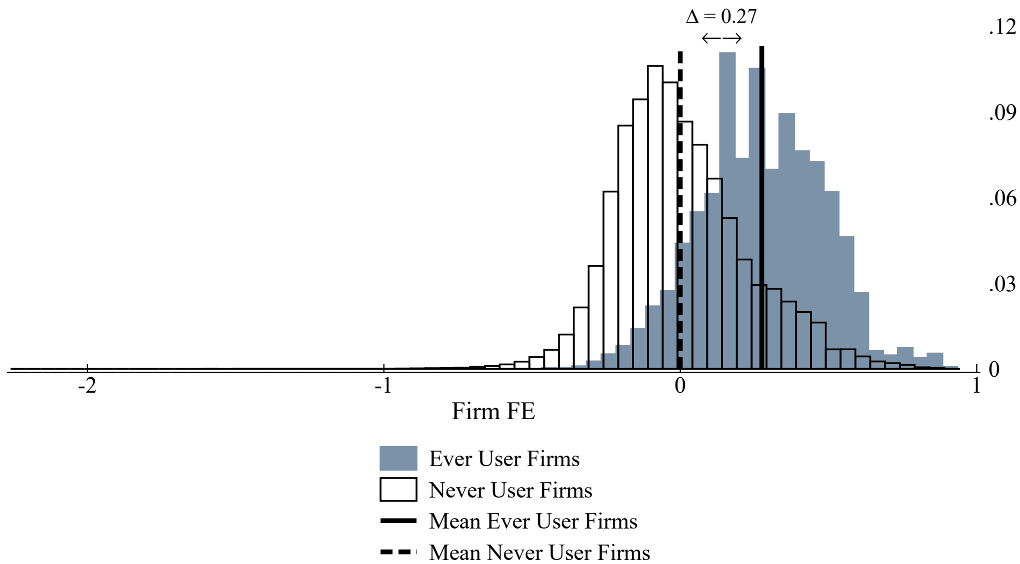
(d) Measurement of Temp Agency Work Arrangements in Argentinian Matched Employer-Employee Data (**Dual Registration**)



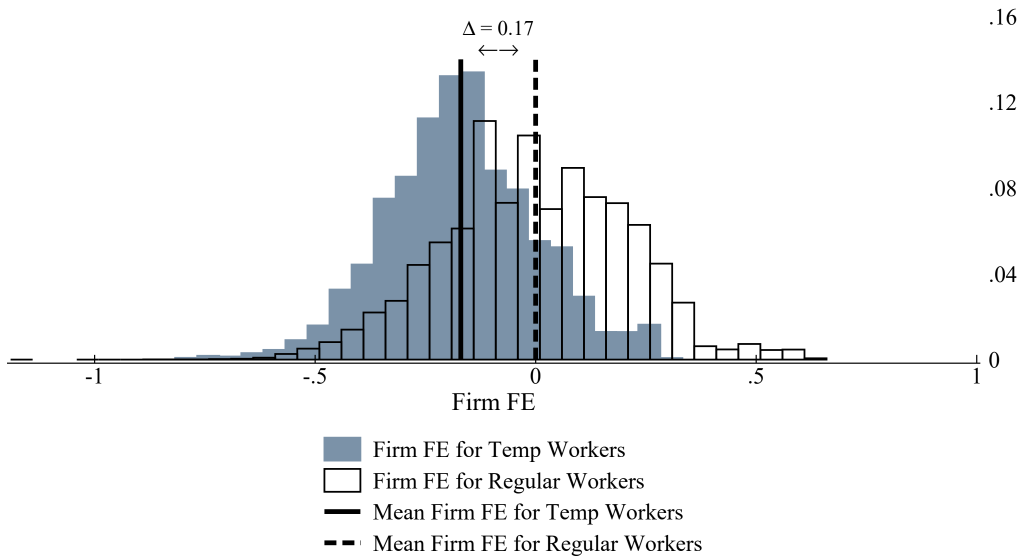
Note: The figure illustrates regular and temp agency work arrangements and their measurement in administrative data. Panel (a) plots regular work arrangements in which employer and workplace typically coincide. Panel (b) illustrates the case of temp agency work arrangements in which a temp agency serves 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: Firm Pay Premia (AKM Effects) For User and Non-User Firms and by Work Arrangement

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



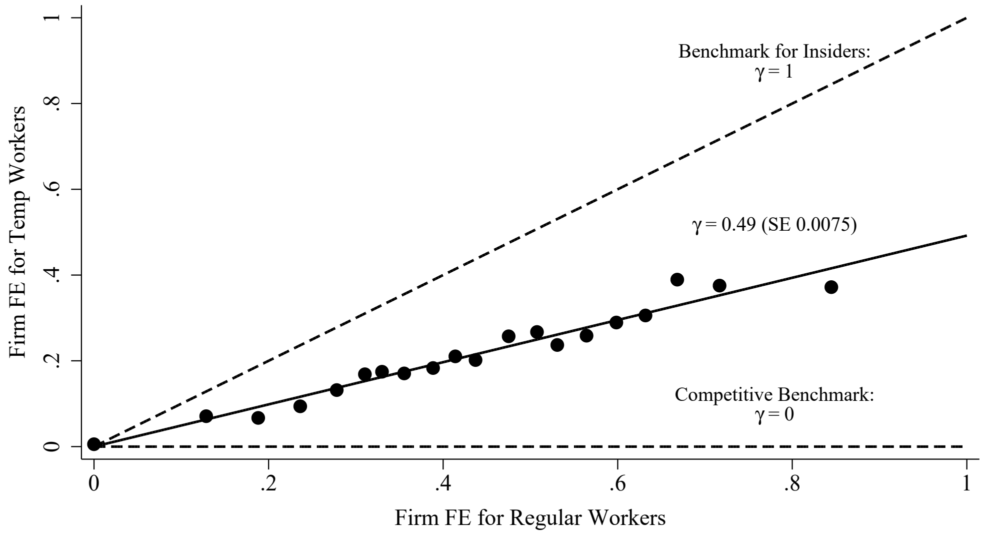
(b) Firm Effects, by Regular and Temporary Agency Work Arrangement (for Ever-User Firms)



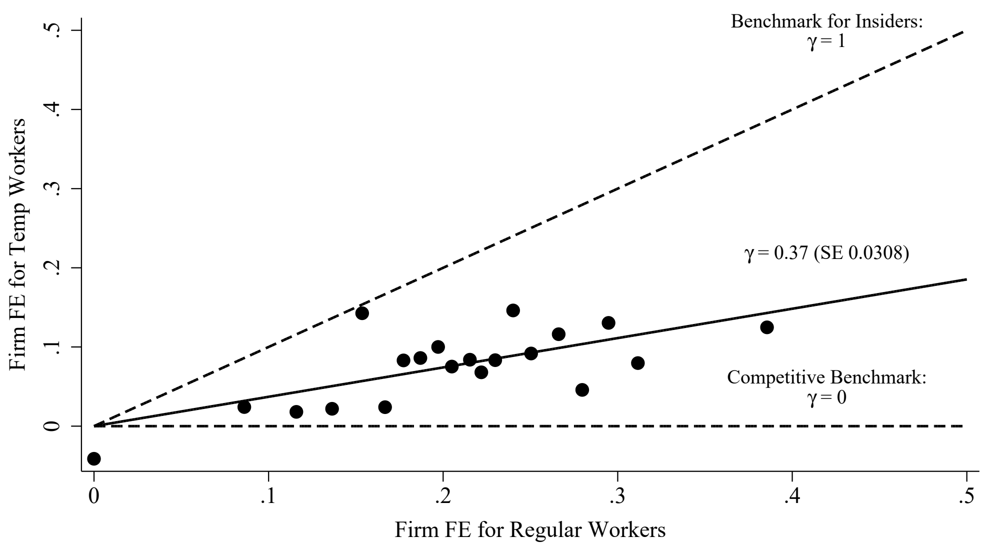
Note: The figures report histograms of AKM workplace effects. Panel (a) studies selection of firms into outsourcing labor (i.e., becoming a user firm of temp agency workers). It plots the histogram of AKM firm effects for regular work arrangements, separately for firms that ever or never hired through temp agency arrangements in our observation period, normalizing the average workplace effect in the group of firms that never hired through temp agency arrangements to zero. 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. Panel (b) 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 specification underlying Panel (b) does not include temp agency fixed effects to permit a comparison across work arrangements, and shifts both distributions by normalizing the mean of regular work arrangement workplace effects to zero. The histograms indicate 17 log points higher workplace pay premia in regular work arrangements. Both panels weight firm observations by total worker-month observations in order to give equal weight to similarly sized firms irrespective of the share of regular vs. temp workers.

Figure 3: Firm-Level Pay Premia Sharing Between Workers in Temp Agency and Regular Work Arrangements

(a) Levels



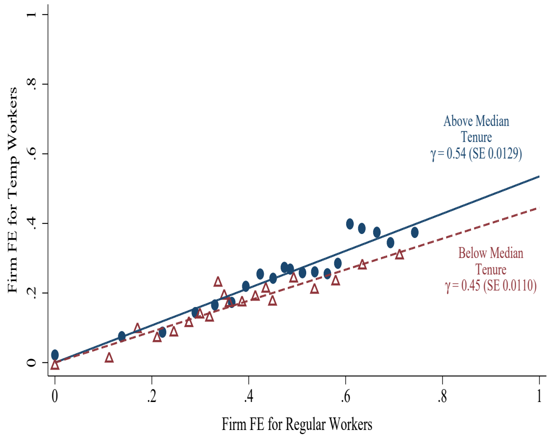
(b) Changes



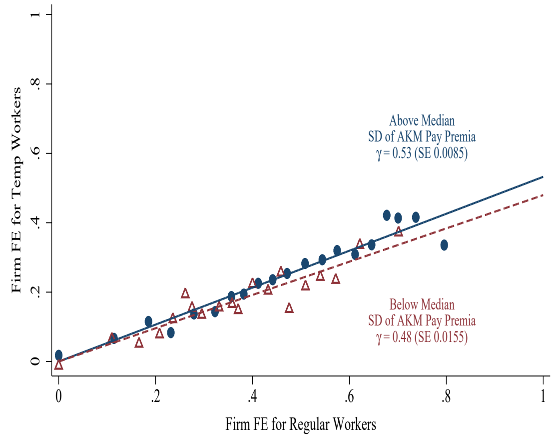
Note: The figure shows a binned scatter plot of estimated firm effects for firms acting as user firms for temp agency workers, ψ_J^T, plotted against firm effects in regular work arrangements, ψ_J^R. Panel (a) does so for a cross-sectional comparison using all years (slope 0.49; SE 0.0075); Panel (b) 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 vingtiles to zero in Panel (a)) (and similarly the change to zero in the bottom vingtile of regular fixed effects changes in Panel (b)). This normalization is inconsequential for our estimation of the *slope*, γ, and would be absorbed by the intercept, in both panels. 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

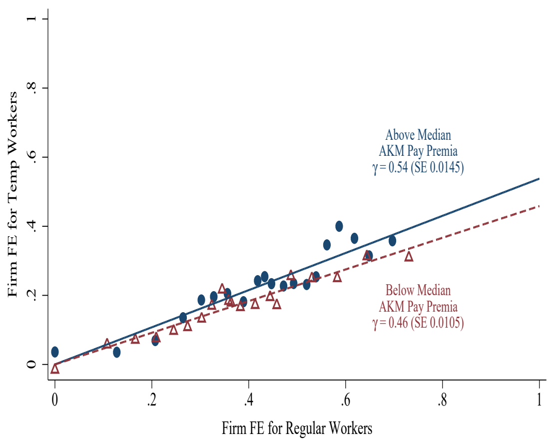
(a) Regular Worker Tenure



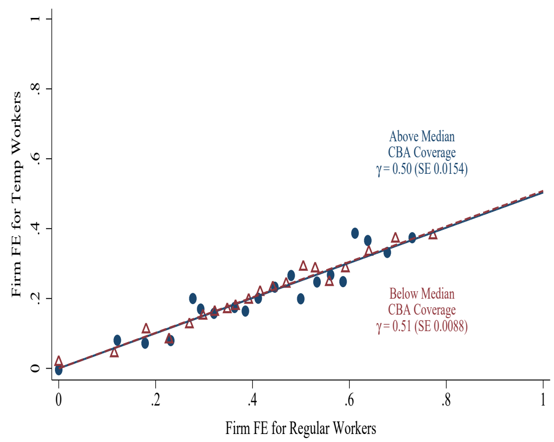
(b) SD of Regular Firm FE



(c) Regular Firm Fixed Effects



(d) CBA Coverage



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***	-0.0745***	-0.191***	-0.193***	-0.0795***	-0.140***
	(0.000523)	(0.00132)	(0.00123)	(0.00123)	(0.000487)	(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 ρ 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:

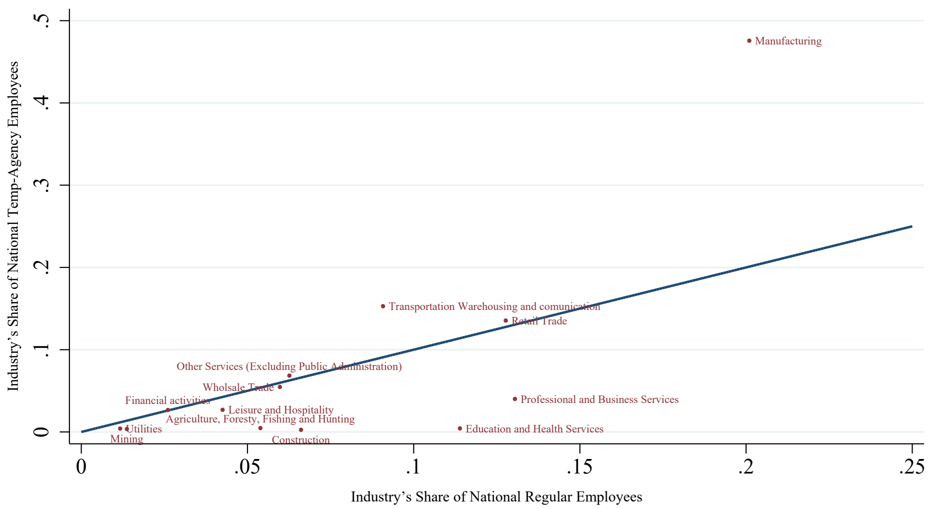
Direct Evidence from Linked Temp Agency-Worker-Client Data

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

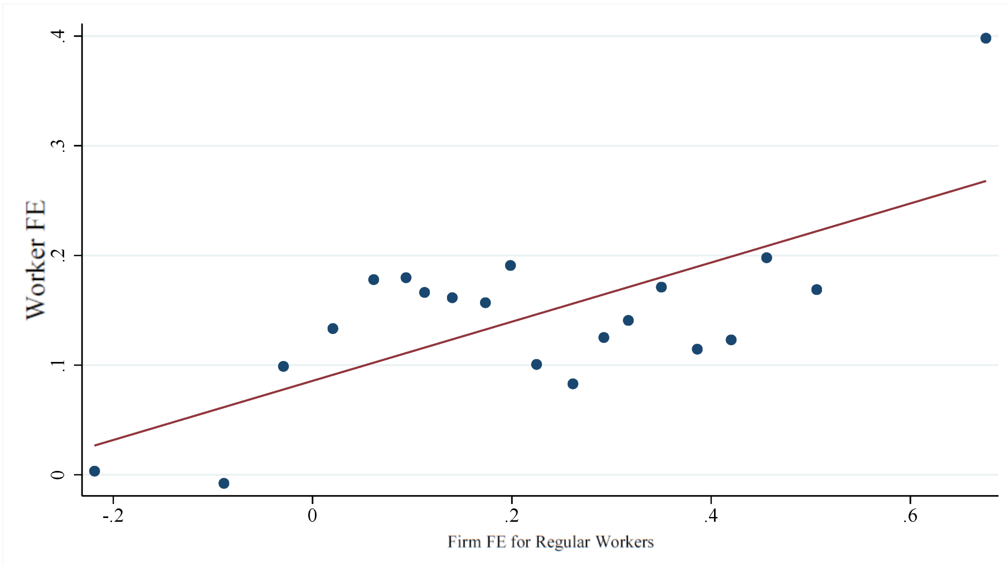


(b) Temporary and Regular Workers' Average Weekly Hours

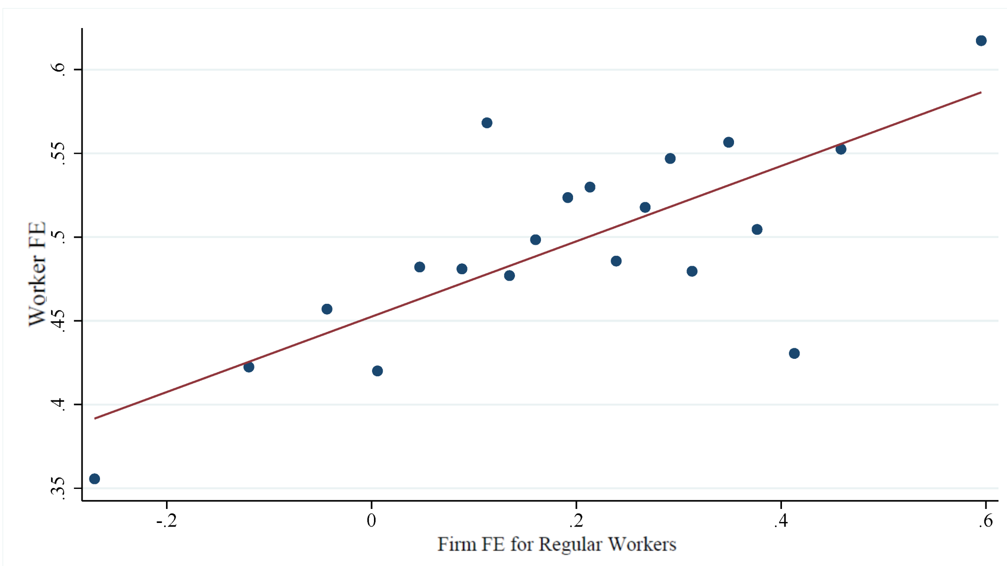
Note: Panel (a) plots the share of national temp agency employment enlisted in an industry against that industry's share of regular employment. Panel (b) plots temporary and regular workers' average weekly hours, as reported in the continuous labor force survey (*Encuesta Permanente de Hogares*) for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

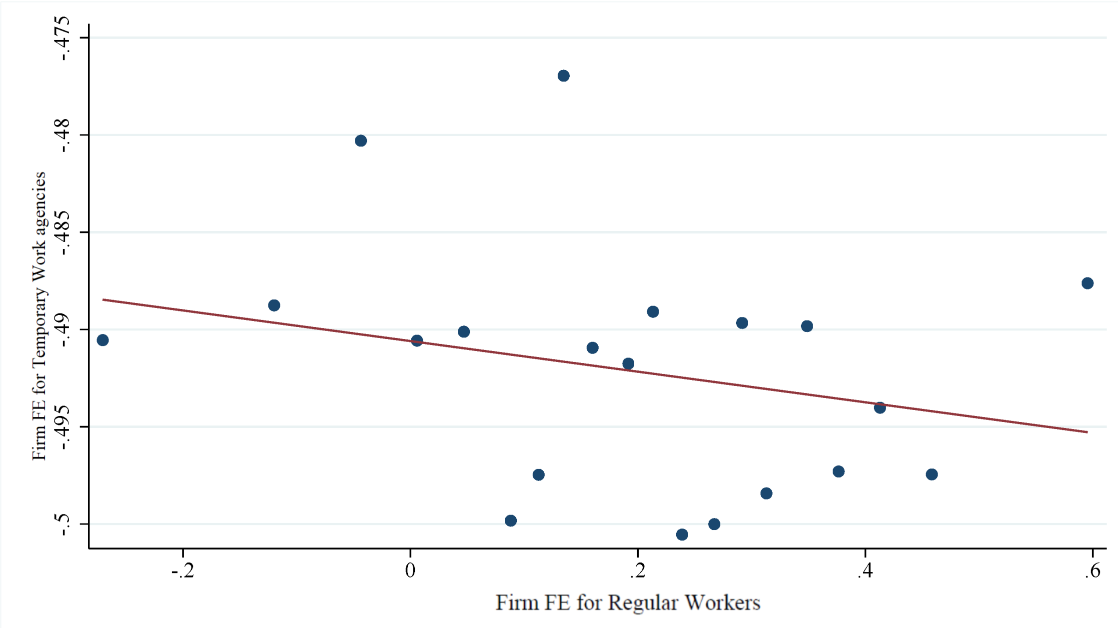


(b) Temp Workers



Note: The figure shows a binned scatter plot of estimated worker effects plotted against estimated firm effects in regular work arrangements, ψ_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). Two limitations of our analysis are that using worker and firm effects to measure assortative matching leads to a downward bias due limited mobility bias (Andrews, Gill, Schank, and Upward, 2008), and that our specification sidesteps the age normalization in the flat portion of the experience profile highlighted by (Card, Cardoso, Heining, and Kline, 2018).

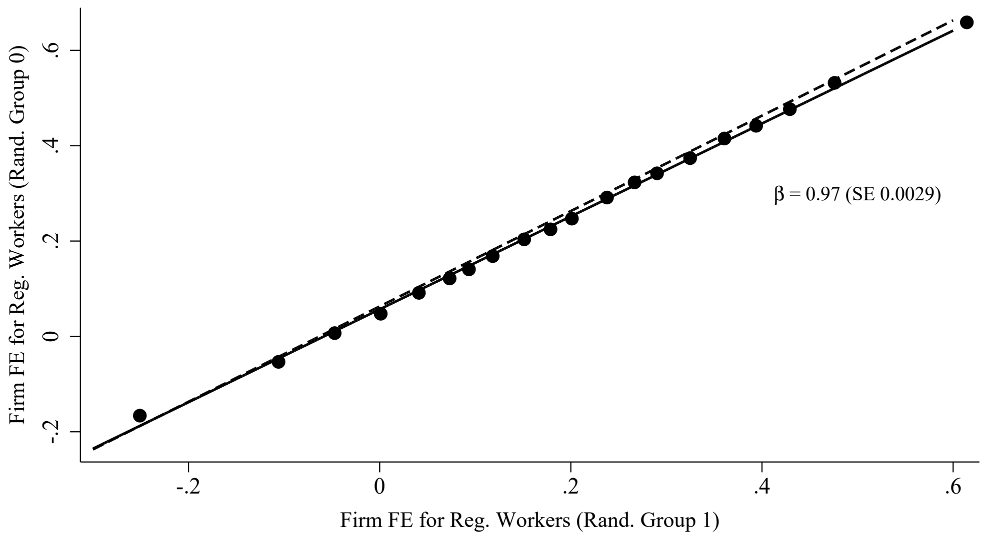
Figure A.3: Sorting in the Temporary Agency Market: Temporary Firm Fixed Effects Against Regular Firm Fixed Effects



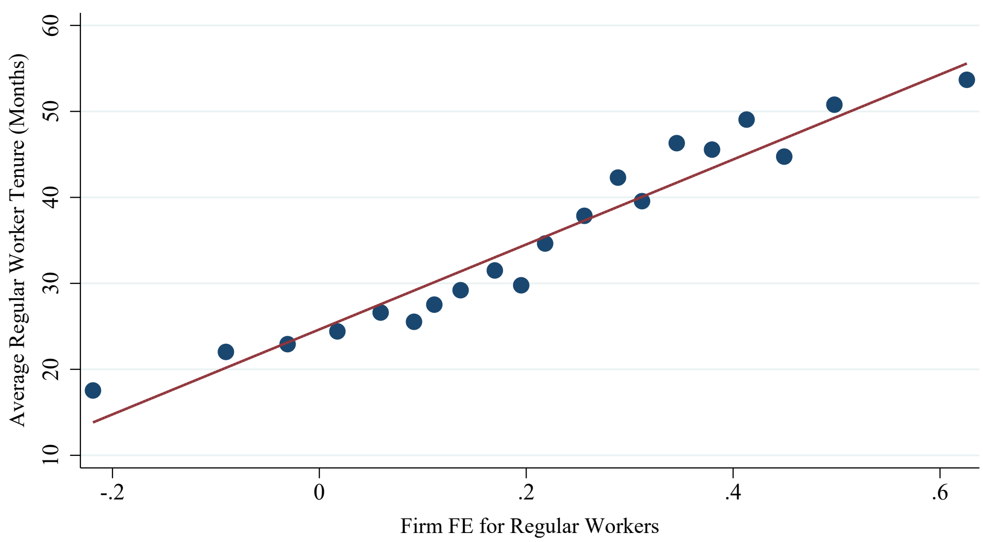
Note: This figure shows a binned scatter plot of estimated firm effects for temporary agency firms, $\xi^{\text{TempAgency}}_{TA_{it}}$, plotted against the estimated firm effects for regular work arrangements, ψ^{R}_{J}. The slope is -0.007 (SE 0.0001). The estimated firm effects of regular work arrangements 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, ψ_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)		
				Unweight.	Weight.	Alt. Weight
		Years				
(Average for all registered workers during each year)	2011	2014	2017		2015	
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
Industry (percent):						
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
Avg. Workers	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)		
				CPS	Weighted	Alt. Weight
(Average for workers in user firms during each year)	2011	2015	2017	2005	2015	
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
Industry (percent):						
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
Wholsale 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
Avg. Workers	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.

C Sample Construction

Our main sample consists of merging two administrative datasets: SIPA and *Simplificacion Registral*. SIPA consists of the universe of formal workers employed in all regions, industries, and types of contracts. This data is available from 1996 to 2018. In order to only focus on private sector workers, we dropped all observations corresponding to national, provincial and local public sector contracts, following a list of unique tax identifiers that were given to us by the Argentine Ministry of Labor.

Simplificacion Registral consists of sworn (audited) statements by the temp agencies collected by the Ministry of Labor. The information submitted by the temp agencies includes information on the worker, user companies, positions, remuneration and dates that reference the start and end of the contract. This information is submitted with a bimonthly frequency, and the data is available from 2008 to 2018.

To construct our sample, we use data from *SIPA* and *Simplificacion Registral* between 2009 to 2017. We avoid including 2008, as it is the first year in which temporary agencies were required to file the information. Similarly, at the time of our analysis, the complete data for 2018 was not yet available, and therefore, we excluded this year too. Furthermore, the bimonthly frequency of *Simplifacion Registral* requires us to take some additional precautions. Because we use SIPA to compute workers earnings, and we can only identify the temp agency (but not the user firm) that is compensating the worker in that dataset, when merging through the worker-temp agency identifier, we cannot associate earnings with spells when there are multiple user firms within a given bimonthly window. Hence, we drop all observations that correspond to two or more user firms within a given bimonthly window for each worker.

Furthermore, to generate the sample that is used in our main analysis, we CPI-deflate all payments to correspond to January 2008 pesos. To avoid outliers, we winsorize earnings at the 1% level on both sides, and drop observations that correspond to earnings lower than the average 2008 minimum wage adjusted by the average annual growth rate (1.5%).

In order to remove ambiguity about sources of earnings, we keep one observation per worker per month using the following rule: (i) when the individual is under a regular work contract, we keep the observation that reports the highest earning, and (ii) if the worker is a temp agency worker, we keep the temp agency observation with the highest earnings reported. Additionally, we remove the first and last observation of each spell, to avoid the inclusion of any extra-compensation associated with job transitions. Lastly, to guarantee computational feasibility when running our main specification, we collapse our sample to 1 observation per spell-year.

D Measurement Error Correction

We probe the robustness of our findings to measurement error, which may lead to a downward bias in γ^{OLS}. The effects ψ_J^R are generated regressors such that the variance of ψ_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 ψ_J^{R,S_1} on those of ψ_J^{R,S_0}.[16] 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 ψ_J^{R,S_1} and ψ_J^{R,S_0}, and find a coefficient of 0.974 (SE 0029, $R^2 = 0.9348$) 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 ψ_J^{R,S_0} serves as an instrument for ψ_J^{R,S_1} (with a first-stage coefficient of 0.974). Hence, the measurement error correction has essentially no effect on our findings.

[16]To generate the split universe of workers, we keep the first observation of each worker and within each firm that corresponds to a first observation unit, we split the sample in two. This way we not only guarantee that half of the workers will be in each group but we also attempt to keep a balance between firms.