Wage Stagnation and the Decline of Standardized Pay Rates, 1974-1991

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Abstract

Using new establishment-by-occupation microdata, we show that the use of discretionary wage-setting significantly expanded in the 1970s and 1980s. Increasingly, wages for blue-collar workers were not standardized by job title or seniority, but instead subject to managerial discretion. When establishments abandoned standardized pay rates, wages fell, particularly for the lowest-paid workers in a job and for those in establishments that previously paid above market rates. This shift away from standardized pay rates, in context of a broader decline in worker bargaining power, accelerated the decline in real wages experienced by blue collar workers in the 1980s.
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Following decades of growth, real median pay for US workers was flat or declining from the 1970s to the mid-1990s (Bivens and Mishel, 2015; Piketty, Saez and Zucman, 2018). Prior research identifies multiple sources of declining bargaining power for blue collar workers. The federal minimum wage was left unchanged from 1981 to 1990 (Autor, Manning and Smith, 2016). Economic globalization exposed some previously high-paying blue collar manufacturing sectors to increased competition and downward wage pressure (Freeman and Katz, 1991). Labor unions that previously raised pay for non-college workers saw their influence fall (Western and Rosenfeld, 2011; Farber et al., 2018). More broadly, skill-biased technological change eroded the relative position of blue collar workers, and in some models even lowered real wages (Acemoglu and Autor, 2011).

Alongside these macro changes came less-studied shifts in employers' pay policies (Kochan, Katz and McKersie, 1994; Caroli and Van Reenen, 2001; Lemieux, MacLeod and Parent, 2009). Following the rise of modern management practices in the first half of the twentieth century, blue collar workers' pay was typically determined by job title and by seniority (Jacoby, 2004). Beginning in the 1970s, however, many employers shifted to more individualized, discretionary pay-setting systems, relying more on managerial assessments of worker performance (MacLeod and Parent, 2000; Heneman and Wener, 2004). We refer to this shift as the decline of standardized pay rates. Standardized pay rates are those in which pay is determined either by job title alone or varies predictably with seniority. In contrast, newly flexible pay-setting for blue collar workers ranged from merit-based raises following annual performance evaluations to informal negotiation with supervisors. Across systems, the decline of standardized pay rates brought increased discretion to managers and offered new ways to differentiate pay among co-workers (Bidwell et al., 2013).

Existing theory implies that the decline of standardized pay rates may have impacted pay levels through productivity and risk channels. In the literature on structured management practices, one tenet of good management is linking pay to performance; if such policies are associated with effective management, this could attract better, higher-paid workers (Van Reenen and Bloom, 2007; Bender et al., 2018). Separate from these indirect impacts, existing research suggests that workers near the top of the wage distribution benefited from the rise of objective performance-based pay (Lemieux, MacLeod and Parent, 2009). More generically, risk-averse workers may demand higher average pay when their pay becomes less predictable (Lazear, 1986). Finally, a large literature finds that performance pay induces positive selection: higher-performing workers are attracted to firms

where they will be rewarded (Lazear, 1998). These channels predict that abandoning standardized pay rates would increase within-workplace inequality in pay, but raise its average level.

However, separate from these channels, firms may have used more flexible pay systems as a means to decrease real wages in a time of shrinking worker power. As labor markets softened for non-college workers (Goldin and Katz, 2008), and with increased competitive pressure on many traditionally high-paying blue-collar employers (Freeman and Katz, 1991; Wilmers, 2018), standardized pay policies likely locked in higher job-wide pay, forcing employers to adhere to raise schedules linked to seniority or inflation. More flexible or discretionary pay-setting, in contrast, could make it easier for employers to skip annual raises, issue smaller pay increases, or pay less to new workers. Under this view, these pay policy changes were one way that decreases in bargaining power were translated into decreased wages.

From this perspective, while the decline of standardized pay rates is not the ultimate cause of wage stagnation, standardized rates served as a barrier to adjustment as employers shifted from a market context of high to low bargaining power for blue collar workers. This mechanism is consistent with the only paper comparing merit-based pay to standardized pay for blue-collar workers, which finds that merit-based pay-setting is associated with lower wages (Brown, 1992). To date, however, the diffusion and impact of flexible wage-setting on blue-collar workers have remained understudied due to limitations in available wage data.

We study pay practices and their connection to wage levels using newly uncovered micro-data on 50,000 workplaces surveyed between 1974 and 1991. The Wage Fixing Authority Survey (WFAS), collected by the Department of Defense to set wages for hourly federal employees, asks private sector employers to report pay levels and pay-setting practices for a number of key blue-collar occupations. The data include a large share of employers subject to repeated surveys, which allows us to analyze wage trends following employer changes in pay-setting method. The WFAS is the only large-scale wage data in the US during this period that gives both firm and occupation identifiers. It offers a unique opportunity to study the impact of pay practices on wage trends.

We first provide descriptive evidence on several novel patterns in pay practices. The use of standardized pay rates decreased dramatically over the 1980s, from three quarters to a half of jobs covered in our data. This was due to a decline in both flat wage levels, in which a job title had only a single rate, and strictly seniority-based within-job variation. Use of standardized rates decreased

most rapidly in non-union and service industry jobs, but the trend is present in a broad range of blue-collar jobs. In their place, pay-setting that gave managers discretion (not piece rate pay or objective production target bonuses) spread rapidly.

This decline in standardized pay was associated with several concrete changes to internal pay structure. It widened wage ranges downwards as minimum real wages within jobs decreased. Firms with flexible pay also separated workers into more distinct wage levels within jobs. For instance, standardized pay establishments with four janitors typically paid them the same rate; under flexible pay, the average four-worker unit had more than two distinct wage levels. Finally, standardized pay establishments were more likely to give general pay increases and pay increases linked to the cost of living, while flexible pay establishments were relatively more likely to make no pay increase at all, or to offer only increases for individual workers.

On average, workers in jobs without standardized pay rates earned less. Comparing similar jobs in the same industry and labor market, we find that non-standardized rate pay was 8 percent lower than seniority-based or single-job rate pay. We also study the abandonment of standardized rate pay within workplaces, using establishments and jobs that are surveyed repeatedly. Panel regressions using establishment-by-job fixed effects reduce the non-standardized rate penalty to 1 percent, suggesting that unobserved features of establishments likely correlate with standardized pay rates and wages. The individualization mentioned above meant that pay effects were not constant across workers within a job. Shifts toward flexible pay were most negative for the lowest-paid workers in a job and for the lowest-paid blue-collar workers in an establishment.

Is flexible pay simply a tag for low-paying jobs? We provide evidence that at least part of the wage penalty for non-standardized pay jobs is not reducible to other observable features of low-paying jobs and coincided with the precise year in which pay policies changed. First, the negative relationship survives the addition of controls for unionization, firm size, and occupational composition. Second, we show using an event study specification that these wage decreases are sharp and coincident with the abandonment of standardized rate pay, suggesting that this change in pay method did not result from already-declining wages. In a simple decomposition exercise, we show that the share of the blue collar wage decline accounted for by the decline in standardized pay rates varies depending on which of these estimates is taken as the true effect: for non-trades blue-collar workers, the decline in standardized pay accounts for as little as 1% and as much as 20%

of the decline in real wages beginning in the 1970s.

These switches away from standardized pay could still reflect shifts in time-varying, unobserved attributes of the establishments. But the sharp timing of these wage decreases suggests that pay policies were an important tool for lowering wages in an environment of decreasing worker power. The connection to broader forces affecting workers is clear in separate analyses of unionization, often viewed as a direct measure of worker power (e.g., Stansbury and Summers, 2020). First, we find that industry-regions with the largest declines in unionization saw larger increases in the use of non-standardized pay. Further, unions protected workers from the negative effects of flexible pay: unionized establishments saw no decline in pay when establishments switched from standardized systems.

Beyond unions, the bargaining power perspective suggests that firms with a historically high level of rent sharing used flexible pay systems to redistribute rents toward employers. Consistent with this idea, prior work finds that a large portion of rising inequality is due to the decline in high fixed effect firms that employ low fixed effect workers (Song et al., 2018). While we cannot estimate worker fixed effects in our data, we identify firms that pay relatively high wages conditional on occupational composition. We find that the wage decreases associated with switching to non-standardized pay were strongest at previously high-paying employers. Flexible pay systems allowed previously generous employers to reduce their firm premium for blue collar workers.

Increased discretion in wages should have also allowed firms to better adjust wages in response to changing business conditions. While pay across our sample is correlated with establishment growth, we find that this link is stronger for workers without standardized pay rates—a natural implication of models simulating decreased wage stickiness (e.g., Schoefer, 2021) and an often cited benefit of flexible pay in interviews with managers (Prokesch, 1985; Smith, 1970). Increased pay flexibility thus allowed employers in our sample, many in beleaguered industries like manufacturing and trucking, to adjust blue-collar workers' wages in the face of decreased growth.

Why did workers, even in a weak labor market and with weakened unions, accept these negative changes? We find that incumbent workers may have been shielded from these effects. Controlling for establishment size, switches from standardized pay are associated with increases in employment in the target occupation. This suggests that the lower real wages observed following the switch may be concentrated among new employees. This pattern aligns with the rise of "two tier" systems used

in this period to maintain differential pay levels across workers tenure (Jacoby and Mitchell, 1986) and with research finding reduced wage stickiness of new hires (Pissarides, 2009).

Together, our findings document a large shift in the pay-setting practices of employers of blue-collar workers. The decline of standardized pay rates brought a new degree of managerial discretion in wage determination. This increased flexibility likely benefited employers, allowing their wage schedules to be more responsive to firm performance and allowing managers to strengthen the link between pay and individual output. However, this increased discretion brought lower, more unequal wages for blue-collar employees.

These findings resolve several limitations in existing evidence on wage trends and changing management and pay practices. Administrative earnings data reveal broad patterns over time but contain no information about specific management or employment practices (Song et al., 2018). Richer establishment surveys have short or cross-sectional time frames, small samples, and cannot be linked to long-run wage trends (Caroli and Van Reenen, 2001; Osterman, 2006). Worker surveys limit analysis to aspects of compensation—bonuses, commissions and piece rates—that happened to be included in the questions, but which make up a small share of compensation for blue-collar workers (Lemieux, MacLeod and Parent, 2009; MacLeod and Parent, 2000). In contrast, our survey data asks employers direct questions about the basis on which *base* pay for workers is set. They cover the critical historical period of wage stagnation and sample the blue-collar occupations that bore the brunt of the pay slowdown. Moreover, the WFAS's establishment-by-job structure allows us to distinguish heterogeneity in effects of pay practices on inequality within jobs, across jobs in the same establishment, and across different establishments.

Our study also complements several strands of research on the selection and consequences of pay practices. Numerous theoretical papers in contract theory study the conditions under which performance pay is optimal (Baker, Jensen and Murphy, 1988; MacLeod and Malcomson, 1998), and studies in labor economics and industrial relations highlight the importance of institutions to trends in wages and inequality (Fortin and Lemieux, 1997; Lemieux, 2008; Kochan and Riordan, 2016). More indirectly, a sizable literature uses data from specific firms on subjective appraisals by managers to understand how these wage-setting systems work in practice (Medoff and Abraham, 1980; Brown, 1992; Baker, Gibbs and Holmstrom, 1994; Cappelli and Conyon, 2018). We link these areas of research by connecting changes in pay-setting regimes at the firm level to macro-level wage

trends.

1 Background

Historical research suggests that pay flexibility for blue collar workers follows a U-shape spanning three periods: informal wage-setting by foremen (before 1910s); increasingly bureaucratized standardized-rate schedules (1910s to 1970s); and, as we argue here, a modern return to management discretion in pay-setting, driven by the decline of standardized pay rates in context of weakened blue collar worker bargaining power.

Prior to the 1910s, American factories were organized either by foremen or by inside-contracted unions of workers (Jacoby, 2004; Montgomery, 1987). As employers asserted more direct control over increasingly integrated production processes, new personnel departments pushed for rule-bound pay-setting as a means to reduce worker turnover (Jacoby, 2004). Standardized pay, where base wages depend on job title alone or strictly vary with worker tenure, became the norm. Standardized pay systems mitigated the fairness concerns aroused by arbitrary foreman pay-setting and made targeted pay cuts infeasible. This shift was also encouraged by increasingly powerful labor unions, which saw standardized pay rates as a way to discourage discrimination and favoritism by supervisors, or competition between workers (Balkin, 1989; Slichter, Healy and Livernash, 1960).

These standardized pay policies constrain employers' ability to change pay differently for workers in the same job title. Lower pay cannot be offered to less productive workers, or to workers hired during weak labor markets. Standardized rates also tend to limit changes in relative pay differentials across job titles because in the most bureaucratic standardized pay systems, job-specific changes must be justified by careful job analysis and evaluation (Sanchez and Levine, 2012). Instead, employers with standardized pay rates typically change pay via across-the-board percentage or flat rate annual wage increases (Foulkes, 1980). Employers with standardized pay policies are constrained to change pay relatively equally across occupations in higher or lower demand, and across individual workers with higher or lower job performance.

While standardized pay scales became the norm for blue collar workers, other workers faced more experimentation. As early as the 1940s, a broad range of companies had implemented salary-linked performance assessments for managerial employees (PennSalt, 1948), and in some industries,

like banks, and in some white collar occupations, merit-based pay increases were ubiquitous by the 1960s (Equitable, 1964; FirstPenn, 1951; ArcherDaniels, 1957).

Surveys and qualitative sources show that, by the 1970s, these policies increasingly reached blue collar workers. A study of merit pay in the mid-1980s found that over half of employers had performance appraisal plans for hourly workers (Council, 1991). One survey found that 80 percent of employers had "implemented or strengthened their merit raise and pay-for-performance programs over the 1980s" (Levine et al., 2002). Another survey of large corporations in the late 1980s indicated that 68 percent of business units had formal performance appraisal programs for hourly production employees (Delaney, 1989). During this period, the most common form of pay-for-performance for hourly employees was management-discretion merit pay, rather than piece rates or objective production target bonuses (Schwab and Olson, 1990).

Under formal merit pay schemes, blue collar workers could be judged in performance evaluations by "attendance and attitude [...] as well as the quality and quantity of work produced" (Foulkes, 1980, 171-172). However, the details of these more flexible pay-setting approaches varied substantially. In some companies, pay rates are determined with little formal review process and by individual supervisors (Jenkins and Lawler, 1981). In one small bank in the 1970s, evoking the factory foremen of the early 1900s, the vice president annually set tellers' wage increases without any formal review and based on his "gut feeling" about their conscientiousness and work ethic (Grove, 1982). One non-union firm had a more regimented system: "The review last November...was just merit. The merit budget was 2.3 percent, with employees getting either 1 percent, 2 percent or 3 percent" (Foulkes, 1980, p. 180). In other cases, immediate supervisors may avoid giving poor ratings and low raises to avoid undermining morale, spurring more oversight from higher managers (Frederiksen, Lange and Kriechel, 2017; Prendergast, 1999; Foulkes, 1980). Regardless of the implementation details, these pay policies allowed employers more discretion over pay-setting for individual workers than would standardized pay rates.

Several simultaneous changes in the 1970s and 1980s seem to have contributed to the decline of standardized pay rates. The declining influence of labor unions removed a key pressure for standardized pay rates faced by unionized employers (Balkin, 1989). Union decline also indirectly impacted non-union employers, who had previously adopted many bureaucratic employment practices to avoid the threat of union organizing (Foulkes, 1980). Technological change and rising import com-

petition during this period also weakened bargaining power for blue collar workers: manufacturing employment peaked in 1979 (Fort, Pierce and Schott, 2018). Finally, a period of high inflation may have created a preference among managers for more flexible pay systems. Cost-of-living clauses in collective bargaining agreements declined sharply in the early 1980s (Devine, 1996), possibly due to past inflation. Mitchell and Abraham (1985) reports that "[m]anagement felt 'burned' by COLAs in the late 1970s, because of unanticipated inflation and certain aberrations in the CPI" (p. 596). These changes could have raised the payoff to employers of adopting more discretionary pay-setting, by allowing them to adjust job-level average real wages downward.

Technological advances also facilitated the shift away from standardized pay rates more directly: new human resources monitoring tools made performance assessment easier and more reliable (Lemieux, MacLeod and Parent, 2009; Aral, Brynjolfsson and Wu, 2012). In particular, Aral, Brynjolfsson and Wu (2012) show that the adoption of human capital management software, performance pay, and HR analytics processes are closely linked. Finally, new regulations pushed companies to adopt performance evaluations for workers in all job categories, to avoid the discrimination liability associated with arbitrary promotion decisions or segregated job ladders (Dobbin et al., 1993). As these technological and regulatory changes made performance evaluations more common and reliable, employers increasingly individualized pay-setting, rather than relying on standardized pay rates.

In the analysis that follows, we study the implications of these widespread changes in base pay-setting practices for average wages of blue collar workers. Predictions from prior research are ambiguous. A large literature in personnel economics evaluates effects of performance pay on productivity (Prendergast, 1999; Lazear, 2000; Bandiera, Rasul and Barankay, 2005; Oyer and Schaefer, 2010). These performance-based methods of compensation are consistently associated with higher and more unequal pay (Pekkarinen and Riddell, 2008; Lemieux, MacLeod and Parent, 2009; Barth et al., 2012).

However, this empirical work has mainly operationalized performance pay as either piece-rate pay (Lazear, 2000) or as bonuses and equity incentives (Lemieux, MacLeod and Parent, 2009; Frydman and Saks, 2010). Measures of these types of flexible pay are available in labor market surveys and in firm-based reporting (for executive compensation). But they are of limited applicability to studying wage trends for blue-collar workers. Piece-rate pay is limited to jobs where output is

precisely measured and bonuses typically account for a significant portion of compensation only for white collar workers, managers and executives. In contrast, the only previous US study of the effect on wage levels of flexible pay-setting practices for blue-collar workers uses a cross-sectional sample of manufacturing establishments and finds that merit pay is associated with low wages (Brown, 1992).

2 Data

We draw on data from the Wage Fixing Authority Survey (WFAS). These data have been gathered annually since 1974 from establishments in 130 local labor markets across the US (Department of Defense Wage Fixing Authority, 1991). Each establishment is asked about pay rates and employment levels for a series of specific job types. The survey data are used to set wage levels for blue-collar federal government employees. They are the only establishment-by-occupation level US microdata that include wage information from multiple industries and which run back to the onset of wage stagnation in 1974. We acquired these data from holdings in the National Archives, which run through 1991. While the survey has continued to be conducted since then, the raw data are no longer deposited with the Archives.

The sampling strategy for this survey is not well-documented, but the survey intends to be representative of wages for a set of blue-collar occupations across a large number of local labor markets. To test the reliability of the WFAS wage data, we compared WFAS hourly wages to earnings from the Current Population Survey Outgoing Rotation Group (CPS) after 1982 (NBER, 2020*b*) and the May Extracts from 1974 to 1982 (NBER, 2020*a*). We matched WFAS and CPS data at the level of occupation, year, region and broad industry. Figure A.1 shows that in both datasets, little wage growth occurred during the period, with mean real pay in the first half of years roughly equal to that of the second half of years. The figure also shows that high-wage occupations and industries in the WFAS also tend to be high-wage in CPS, with a correlation of around 0.4 in both periods. While there is sampling variance in both data sources, this check indicates that the WFAS wage data are approximately consistent with standard CPS occupational and industry wage measures during the same time period.

Crucially for our purposes, the WFAS survey provides substantial detail about both the structure

of pay in an establishment and the way it is set. Employment levels and wages are asked for each common pay rate within each job category and within each occupation and each establishment. So each distinct hourly wage paid within the establishment is reported separately in the survey (see lines 9, 10 and 11 in Figure A.2).[1] If a job is governed by a single formal pay scale, this scale is also reported (see line 15 in Figure A.2). Alongside that scale, the data include a question asking each employer about the basis for wage differences within job categories. Respondents can choose none (for no within-job variation) (39%), longevity (tenure) (25%), merit (13%), a combination of merit and longevity (16%), or other (6%) (see line 16 in Figure A.2). This question provides a rare opportunity to observe directly the grounds on which wages are set. In the analysis below, we define non-standardized or flexible pay jobs as those that include either narrow merit, combination or other within-job variation. These compare to standardized pay jobs, in which pay either does not vary within job title or pay varies exclusively with worker tenure. We also control for the small number of jobs paid according to piece rates (0.5% of the sample) and for whether a job receives a production bonus (16%). Table 1 summarizes descriptive statistics for the data.

[Table 1 about here.]

The WFAS samples employers to cover the set of blue-collar occupations employed by the federal government. While this is not a representative sample of employers of all occupations, it covers a wide array of large blue-collar occupations, ranging from skilled building trades electricians and plumbers to janitors, assemblers, packers and food service workers. The resulting sample is drawn from a varied set of companies and industries and from across 130 labor markets, covering essentially the entire US. Figure A.3 shows that the largest portions of the sample come from heavy industry, but a variety of light industry, transportation and wholesaling industries are also well-represented. The WFAS also includes a substantial sample of hospitals, which rival industrial machinery and transportation equipment manufacturing as one of the primary industries in the sample. Figure A.4 shows the largest employers in the WFAS, which include a number of household names, from General Electric to United Airlines to St. Joseph's Hospital. Overall, the composition of the WFAS sample may not be representative of employers overall, but it does include a range of different types

[1] Without weights, analysis of data in this format would overweight jobs with more wage levels. In all analyses, we weight the data by the inverse number of rows within each job-by-establishment to give each job an effective weight of 1. In sensitivity checks below we show the robustness of our results to alternative weighting schemes.

of employers of blue-collar workers.

The WFAS is primarily a repeated cross-sectional survey. However, many respondents are repeatedly sampled across years. Moreover, in the later period of the data (1979 onward), the WFAS began collecting a one-year follow-up "Change Survey" to ask respondents how wages and employment had changed during the preceding year. Figure A.5 compares the overall distribution of WFAS establishments over time to the establishments that are observed at multiple times. Even excluding the Change Survey establishments, which cover only a subset of survey questions, around one quarter of respondents are repeated in each year.[2]

3 Descriptive evidence on the decline of standardized pay rates

Figure 1 plots real wage trends from several different data sources.[3] The Bureau of Labor Statistics (BLS) Current Employment Statistics (CES) production workers wage series is the most commonly cited production workers' wage series and relies on surveys of establishments (US BLS, 2015). It shows steadily rising wages up through the mid-1970s, followed by overall decline until the mid-1990s.

During this period, a substantial portion of employee compensation was accounted for by non-wage benefits, so some commentators attribute wage stagnation to a trade-off between wage and non-wage benefits. The Employer Cost Index (ECI) series couples wages and salaries with employer costs associated with bonuses and other incentives and health, retirement and leave benefits (US BLS, 2013). This broadened definition of compensation shows a similar trend to the CES. Finally, the chart shows the series for average earnings of the bottom 50 percent of the income distribution from the Distributional National Accounts (Piketty, Saez and Zucman, 2018, 2020). These data, based on a combination of the Current Population Survey, the BEA's national income data and tax data, are noisier, but show a stagnation pattern similar to the establishment-based BLS series.

[Figure 1 about here.]

[2]We repeated the analyses shown below excluding Change Survey observations, which will misrecord variables like pay method or union presence if a change in status happens after a full survey and prior to the Change Survey. Results are generally consistent with those for the full sample. The main difference is the strongly balanced version of the event study, which depends on the Change Survey observations to attain sufficient power.

[3]Throughout the paper, we deflate wages using the Consumer Price Index for All Urban Consumers (CPI-U). Using the Personal Consumption Expenditures (PCE) reduces the observed wage decline during this period, but otherwise leaves results unchanged.

Figure 1 also plots a wage series calculated from the WFAS data, which shows a wage trend for blue-collar workers broadly consistent with all of these series. This consistency provides evidence for the reliability of the WFAS data. Indeed, beyond the common general wage decline, all data sources show a brief increase in wages in the mid 1970s, followed by a sharp decline during the high inflation period from 1978 through 1980. After 1980, wages declined more slowly through the mid-1980s. But by the late 1980s, real wage declines had accelerated and continued to do so until the Clinton boom in the late 1990s. In sum, real wages declined for blue-collar workers by around 20% during the 1970s and 1980s, and this pattern is mirrored in our data.

[Figure 2 about here.]

Next we turn to the method of pay, a unique advantage of the WFAS over the other sources of wage information in Figure 1. Figure 2 shows that non-standardized rate wage-setting became increasingly prevalent, compared to standardized wage-setting according to seniority alone or by single-wage job titles. In 1974, around three quarters of jobs in the WFAS were covered by standardized pay rates. By 1991, only half of these jobs were covered, while the remainder were subject to some form of flexible and management-discretion pay.

[Figure 3 about here.]

The WFAS data also provide evidence that this rapid decline in standardized rate pay did not simply involve renaming standard pay-setting practices. Figure 3 shows that wage distributions under flexible pay setting were both wider and lower than jobs under standardized rate pay. This difference in pay inequality corroborates Lemieux, MacLeod and Parent (2009) but focuses on a different method of performance-linked pay, discretion over base pay setting, that is more relevant for blue collar workers.

In contrast to the household survey data used in Lemieux, MacLeod and Parent (2009), the WFAS allows us to document that the move away from standardized pay rates also affected internal pay structures, resulting in more distinct wage levels and broader formal scales. Figure A.6 plots the average number of wage levels against the total number of workers, treating each job within an establishment as an observation. The figure shows that, at all levels of employment, workers under flexible pay schemes were more likely to see pay differences within job title. Figure A.7

shows that simultaneous to the decline of standardized pay rates, the width of formal pay brackets increased steadily, roughly doubling from 1974 to 1991. This widening affected both building trades (like pipefitters and carpenters) and non-trades jobs (like janitors and warehouse packers). Actual or realized wage spreads within jobs grew more slowly. But, formal pay scales widened, allowing increased discretion for managers in assigning wage rates to individual workers. The decline of standardized pay rates was coincident with more within-job variation and lower formal minimums in pay scales.

Figure A.8 provides more detail on which kinds of establishments abandoned standardized rate pay. Non-union workplaces had higher rates of flexible pay at the beginning of the period and drive almost all of the shift from standardized pay. Geographically, flexible pay increased most rapidly in the West, with slower increases in the rest of the country. Standardized pay rates were consistently less prevalent in the service industry; even at the beginning of the period, a majority of blue-collar service jobs had flexible pay. But, the decline of standardized rates occurred across multiple industries. Likewise, while standardized pay rates are most common in larger workplaces and in workplaces with lower shares of white collar and clerical workers, the decline of standardized pay rates was felt across workplaces of different sizes and worker compositions. The lower incidence of standardized pay rates in non-union, service industry and small firms is consistent with prior research on how unionized and large firms established rigid pay practices from the 1930s to the 1970s (Jacoby, 2004; Balkin, 1989; Cobb and Lin, 2017). But, the widespread upward trends across different types of workplaces also demonstrates that the erosion of standardized pay rates in the 1980s affected a broad swath of workers.

The decline of standardized rate pay was coincident with a decline in unions. Unionization in our sample decreased from 45 to 32 percent over the full period, and, as noted above, anecdotal evidence suggests that unions were likely to resist standardized-scale abandonment. One way to study the connection between pay systems and worker bargaining power is to look at how flexible pay changed in places and industries where workers bargaining power declined. We group the years 1974-1976 and 1989-1991 and calculate the share of workers in each region (WAC) by industry (two-digit SIC code) that are unionized and under flexible pay for each time period, then take the long difference. The binned scatter plot in Figure A.9 shows clearly that less unionization meant more flexible pay. Within industry-region cells, a 20 percentage point decrease in the share of unionized workers was

associated with a 4 percentage point increase in the share of workers under non-standardized pay schemes.

The decline of standardized pay rates is consistent with prior research focused on variable compensation and performance pay (Lemieux, MacLeod and Parent, 2009). However, the WFAS data document a broader rise of managerial discretion in determining base pay, separate from the spread of smaller components of compensation such as commissions, bonuses, and piece rates.[4] The sparse data on rates of flexible pay-setting of this kind—entirely drawn from infrequent surveys from compensation consulting firms, cited above—also suggests an increase in managerial discretion in pay-setting during this period (Heneman and Wener, 2004). The WFAS results provide the first systematic evidence that the move away from standardized pay rates—often associated with the rise of white collar, sales and professional workers—also affected blue-collar workers, like janitors, warehouse pickers and food service workers.

These blue-collar workers were also those who saw their bargaining power and wages stagnate since the 1970s. Consistent with this, Figure 4 provides descriptive wage information for the most common occupations appearing in the WFAS data, splitting workers into standardized pay and flexible pay jobs, across union and non-union workplaces. Across all occupations, those working under standardized pay rates practices are paid more than those without standardized rates. These within-occupation wage differences are substantial, generally ranging from 10% to 30% penalties for workers not paid under standardized rates. Higher-paid occupations, like those in the building trades, face a smaller non-standardized rate penalty than lower-paid occupations, like maintenance laborers and warehouse packers. These penalties are also larger among non-union workers than among union workers. These occupation-level wage gaps between standardized and flexible pay practices provide initial descriptive evidence that jobs without standardized pay rates face lower wages, a relationship we explore further below.

[Figure 4 about here.]

[4]Indeed, Lemieux, MacLeod and Parent (2009) acknowledge that their measure of performance pay is more relevant for white collar than for hourly workers. In addition to the small share of total compensation attributable to non-base pay among hourly workers, worker survey data lump overtime pay with true performance-based pay, thus "it is likely that the performance-pay component we construct will be noisy for hourly workers" (Lemieux, MacLeod and Parent, 2009). The WFAS merit data provides an alternative approach to tracking performance-related pay that is more relevant for hourly workers.

4 Wage changes and the decline of standardized pay rates

4.1 Job fixed effects regressions

We use the following wage equation to estimate the effect of non-standardized rate pay setting on wages,

$$log\ w_{itc} = \beta NonStand_{itc} + \alpha_i + X'_{itc}\gamma + \epsilon_{itc}, \tag{1}$$

where hourly wages w_{itc} in job-by-establishment i, year t, and at common pay rate c are predicted by an indicator for the absence of standardized pay rates (or the presence of merit-based or managerial discretion over pay) $NonStand_{itc}$, and α_i denotes a vector of fixed effects for job-by-establishment. As described above in Section 2, each distinct hourly wage, which we index by c, constitutes a different row in the data with its own reported headcount. Throughout all models, standard errors are clustered at the establishment level.

We include a matrix of controls X'_{itc}. In all specifications this includes the three measures of headcount contained in the data: the number of workers at the pay level, the number of workers in the job (e.g., total janitors), and the number of workers in the given establishment (Bloom et al., 2018). We also try to address several competing explanations for shifting wage determination during the period. Prior research identifies declining labor market institutions, shifting supply and demand for skill and organizational changes as key determinants of wages (Card, 2001; Farber et al., 2018; Autor and Dorn, 2013; Weil, 2014; DiNardo, Fortin and Lemieux, 1996).

First, we address labor market institutions by controlling for establishment and labor market union presence, as well as state-level real minimum wages. Labor unions increase wages and historically resisted flexible wage-setting practices (Freeman, 1982). We control for establishment-level union presence using a WFAS question asking whether a collective bargaining agreement governs employment conditions at the establishment. Second, in heavily unionized industries, union threat can drive even non-union employers to embrace standardized, non-merit wage structures (Jacoby, 1984; Farber, 2005). We therefore also control for the industry by labor market region union density. Third, as noted above, the decline in real minimum wages during the 1980s had a negative effect on low-wage workers' pay (Autor, Manning and Smith, 2016). We control for the time-varying

state-level real minimum wages.

Next, changing supply and demand for workers by skill-level during this period drove increased pay for highly educated workers, but stagnation for non-college workers (Goldin and Katz, 2008). While we cannot measure technological change directly, we can proxy for worker skill composition. At the workplace level, we control for the share of managerial and clerical office workers, relative to blue-collar workers, since establishments increasing their demand for skill should see their white collar share increase. At the labor market level, we include time-varying fixed effects for year $\times$ industry $\times$ occupation $\times$ wage area code. Wage area codes are the key sampling geography for the WFAS and are typically made up of several adjacent counties. Comparing workers in standardized rate and non-standardized rate jobs in the same wage area region, same occupation, same year, and same industry (broad SIC codes) nets out a variety of occupation- and geography-varying supply and demand forces.

In addition to institutions and market supply and demand, other organizational changes could also affect wages. Beginning in the 1980s, many firms shifted to outsourcing, which can isolate low-wage workers from potential rent-sharing with high-skilled workers (Weil, 2014; Goldschmidt and Schmieder, 2017). We control for average co-workers' occupational level (in other blue-collar positions) to address potential wage effects of occupational segregation.

Beyond this set of controls, unobserved heterogeneity between establishments with and without standardized rate pay could still bias results. Perhaps establishments with more aggressive managers drop standardized rate pay practices and also work to restrain labor costs. The partial-panel data structure noted above lets us include establishment-by-occupation fixed effects to estimate the wage effect of changes in pay practices. The coefficient β in the full model is thus identified by comparing changes in wages associated with a job losing standardized pay rates, relative to changes in wages associated with a similar job in the same labor market which does not switch away from standardized pay rates.

Table 2 shows results from the core wage models, where we incrementally strengthen controls across columns. Column (1), with controls for just establishment size, job size and year, shows that workers without standardized pay rates face a 14 percent wage gap. In column (2), where we add the controls for other institutional and organizational factors that could affect both pay methods and wage levels, the coefficient drops to 11 percent. In column (3), we add fixed effects for labor

markets. Even comparing workers in the same occupation, industry and labor market, those at workplaces without standardized pay rates receive 8 percent lower wages.

[Table 2 about here.]

These controls account for several potential alternative determinants of wage levels. But, as noted above, the positive relationship between wage levels and standardized rate pay could still be driven by unobserved differences between firms. In column (4) in Table 2, we add establishment-by-occupation fixed effects, so that we compare jobs in the same establishment that switch between standardized pay rates and flexible wage-setting. The result shows that restricting the comparison to switching jobs substantially attenuates the negative standardized rate pay-wage level association. However, switching away from standardized pay rates is still associated with around a 1 percent reduction in real wages.

Finally, we address other simultaneous, potentially unobserved changes by comparing workplaces that switch from standardized pay rates relative to other workplaces that are part of the same national company but that do not drop standardized pay rates. Specifically, we add firm name by year fixed effects to the model. By doing this, we hope to adjust for any other employment policy changes within a firm that might be rolled out at the same time as standardized pay rates are abandoned. We only have a small number of multi-establishment firms that have multiple establishments appear in the same year in these data. Nonetheless, the results in column (5) of Table 2 show that the point estimate remains negative and of a similar magnitude as column (4). Even controlling for other simultaneous, firm-wide changes, the implementation of merit pay is associated with lower wages.

4.2 Event study

Observed differences in pay in Table 2 might still arise from time-varying unobserved factors—e.g., declining product orders—that affect both wages and the probability of adopting more flexible pay-setting, possibly within firms. We can probe this possibility using an event study specification, with the establishment-by-job's first switch away from standardized pay rates as the focal event. This flexible specification allows us to examine the average trajectory of wages before and after

standardized pay rates are abandoned, conditional on controls. The estimating equation is:

$$log\ w_{itc} = \alpha_i + \sum_{k \in S} \delta_k \mathbf{1}(t = k) + X'_{itc}\gamma + \epsilon_{itc}. \tag{2}$$

In this setup, as before, i denotes a job within an establishment, c denotes a wage level within a job, α_i indicates fixed effects for a job-by-establishment, X'_{itc} gives a matrix of controls, and ϵ_{itc} is the residual. The series δ_k give the standard event study coefficients, which indicate time until and from dropping standardized pay. The set S counts years since any wage level within the job switched from standardized pay rates, binned at the endpoints and omitting the period before the switch. (Event time cannot be assigned to the distinct wage levels because these cannot tracked across survey waves.) The matrix X'_{itc} includes the same controls as the model in column (4) from Table 2, namely the stringent fixed effects for the intersection of year, city, and occupation and time-varying controls including head count and union presence. Standard errors are clustered at the establishment level.

Our data do not constitute a balanced panel since firms are not consistently re-sampled each year. The fixed effects α_i address the most innocuous attrition, but if selection is correlated with wages and determinants of standardized pay rate use, our estimates of the dynamics δ_k could still be biased. In our main specification, we drop switchers that have fewer than two observations before and after the change to merit pay and perform additional checks below.

Figure 5 plots the coefficients δ_k, with point estimates shown in the first column of Table A.1. The event study shows that wages are fairly steady prior to the switch away from standardized pay rates. After standardized pay rates are dropped, there is an immediate and sustained reduction in real wages of around 1%. The sharpness of the change suggests that standardized pay rates are not abandoned during a time of already-declining wages, but instead the move away from standardized pay rates permits a subsequent within-job drop in real wages.

[Figure 5 about here.]

In Figure A.10 we perform two checks to confirm that this result is not sensitive to the way the event study sample is constructed, with the corresponding point estimates in columns (2) and (3) of Table A.1. First, we change the event time indicators to count the number of surveys since the switch

away from standardized rates rather than the number of years, retaining the same specification as before. In the second plot, we strengthen the balance requirements so that firms must appear three times before and after the switch from standardized rates and reduce the endpoints from 6 to 4 years before and after the switch since the number of switchers decreases substantially (see column (3) in Table A.1). In both cases, we find the same sharp decrease in wages during the year that standardized pay rates are dropped and continuing afterward.

Taken together, these estimates suggest that employers abandoned standardized pay rates and cut real wages simultaneously. This pattern is consistent with standardized pay rates serving as a bulwark that made downward adjustment of wages more difficult. When employers switched to merit-based and other pay schemes that allowed managerial discretion, they were able to reduce blue-collar workers' pay. As noted above, this all occurred during a general decline in the labor market position and bargaining power of these workers. We therefore interpret these results as evidence for the proximate, not ultimate, causal role of standardized pay rates in facilitating wage decline. During a period of declining bargaining power for blue-collar workers, more flexible pay setting practices allowed employers to adjust real wages for these jobs downward.

4.3 Decomposing wage stagnation

Next, we quantify the contribution that pay decreases associated with the decline of standardized pay rates made to the overall decline in real wages for blue-collar workers during this period. Because some workers began the period without standardized pay rate jobs, and even by the end of the period half of workers still held standardized pay rate jobs, the wage penalty associated with the decline of standardized pay rates needs to be scaled by the share of workers who actually faced a change in wage-setting practices. Moreover, the models above show that the non-standardized pay rate penalty varies substantially with the inclusion of controls and especially with job panel-based estimates.

To show sensitivity across model specifications, we compute simple counterfactual wage trends by taking predicted values from the models in Table 2. We take the estimated coefficients from Equation 1—namely $\hat{\beta}, \hat{\alpha_i}$ and $\hat{\gamma}$—and predict $\widehat{log\ w_{itc}}$ using the actual data, but fixing the flexible pay indicator $NonStand_{itc}$ at zero. All coefficient estimates change across models as we vary the controls. The changes over time of the year averages of these counterfactual values $\widehat{log\ w_{itc}}$ quantify

the impact of the decline in standardized pay rates over time. By repeating this for each model in Table 2, we obtain trends based on larger and smaller estimates of the non-standardized rate pay penalty.

Figure 6 compares the resulting counterfactual trends to the observed real wage decline. We separate trends for non-trades workers (like janitors and food service workers) from those for trades workers (like mechanics and electricians) as the wage decline was twice as steep for the former group.[5] Non-trades workers experience declines of around 30% from the 1978 peak, while workers in trades occupations wages only fell 10%. For non-trades workers, retaining standardized pay rates accounts for between 20% and 1% of their real wage decline. For trades workers, retaining standardized pay rates account for between 16% and 4% of their smaller decline.

[Figure 6 about here.]

The magnitude of real wage reductions associated with the decline of standardized rate pay are thus dependent on model specification, but range from a small share to a significant supplementary source of wage stagnation during in this period.

These models and decompositions leave open the question of why firms' move away from standardized pay rates was associated with real, within-job wage declines. We next consider potential mechanisms linking the decline of standardized rates to wage levels.

5 Mechanisms and Heterogeneity

5.1 Heterogeneity by high- and low-wage jobs and firms

Flexible pay-setting should allow a wider range of wage rates, as employers distinguish among workers in the same job. This increase in variance could be symmetrical and leave the mean wage unaffected. However, if this change in pay-setting was part of a shift in rents toward employers, flexible pay could asymmetrically widen wage rates downward: the adoption of flexible pay should lower wages at the bottom of a firm's blue collar wage distribution more than it raises wages at the top.

[5] We divide trades from non-trades using the cut-off of job grade 8 from the 1981 Federal Wage System Job Grading System. This cut-off point effectively captures jobs that require mainly on-the-job training from higher-grade trades jobs that require apprenticeship training.

The point estimates plotted in Figure 7 test this prediction. We chart coefficients from models similar to those estimated in column (4) of Table 2, estimating wage changes around switches away from standardized pay rates. First, to study changes in the formal range of pay within-jobs, instead of predicting real wages, we estimate the average top and bottom of each formal pay scale within the jobs losing standardized pay rates. Figure 7 shows that the pay scale widens considerably, largely due to a substantial negative effect on the pay scale floor. The top of the pay scale also increases slightly however: switching away from standardized pay rates is associated with wider pay scales and even the possibility of *higher* pay.

We next examine how these effects of abandoning standardized pay were felt across worker ranks. To do so, we interact the standardized pay-setting indicator with a categorical variable defining whether a given observation is at the bottom, top or in the middle of its job-by-establishment's pay distribution. The real wage range within-job estimates in Figure 7 show that consistent with the changed formal pay scale, real wages for the lowest paid workers within a job decline by around 4%, or around four times as much as the mean wage effect given in Table 2. Workers in the middle of a job's pay range also experience a smaller, 1% real wage decrease. In contrast, the highest paid workers within a job experience a small increase in pay following the shift away from standardized pay-setting. Overall, this increase in within-job inequality is consistent with the widening of formal pay scales, but is somewhat compressed in magnitude.

Next, we fit an analogous model to study within-establishment, between-job inequality effects of the switch to flexible pay. Figure 7 shows results from a model that interacts the switch away from standardized pay with a categorical variable indicating whether a given job is the highest, lowest or middle paying position within an establishment. The results show a pattern similar to the within-job models: the lowest paid job within the establishment faces the sharpest decline in wages. Switching away from standardized pay rates heightens inequality between co-workers in the same job, as well as between jobs, within-establishments.

[Figure 7 about here.]

This inequality increase is consistent with the predictions made above, arguing that merit-based and flexible pay-setting relaxes constraints on within-workplace inequality. However, even for the highest paid blue-collar workers within jobs and within establishment, moving away from

standardized pay rates does little to raise their wages. This small pay increase is swamped by the larger pay increase for workers at the bottom of the pay distribution, resulting in the average negative effect seen in Table 2. One explanation for this asymmetrical widening is that workplaces that drop standardized pay rates reallocate higher pay increases to white collar workers. This is possible, but in our data establishments with a higher share of office workers do not show stronger negative wage effects. As such, within-establishment upward earnings redistribution alone is likely insufficient to account for the negative wage effect of abandoning standardized pay during this period.

More likely, the average negative wage effect observed in these models results from loosening the connection to prior wage schedules for employers who were previously locked into elevated pay. In this process, it should be employers who were previously paying above median rates that see the largest real wage decline with the adoption of flexible pay-setting. The final estimates in Figure 7 test this idea by interacting the switch away from standardized pay with a categorical variable indicating whether the establishment was previously relatively high or relatively low paying. We categorize establishments by fitting a two-way fixed effects model, which estimates a vector of establishment fixed effects, conditional on a year by city by industry by occupation control. We include only standardized pay firms in this initial model. The resulting establishment fixed effects track whether the employer pays more or less than other standardized firms operating in the same labor market.

The last two columns show results from interacting this establishment fixed effect with switching from standardized pay. As predicted, high-paying establishments face the strongest reduction in pay upon switching away from standardized pay rates. In contrast, when already low-paying establishments abandon standardized pay rates, there is a negligible and not statistically significant effect on pay levels. These results support the idea that standardized pay rates constrained employers to pay elevated wages during a period of declining bargaining power for blue collar workers. Shifting to more flexible pay setting allowed increased inequality within-workplaces and lower pay for blue-collar workers in previously high-paying establishments.

A final dimension of heterogeneity in the effects of standardized pay comes from the relationship between unions and pay-setting practices. Specifically, non-standardized pay had different wage consequences in establishments with unions, which often resisted these changes (Balkin, 1989). We

run the same the same specifications from Table 2, estimating a different effect for three types of establishment-job cells: never union (59 percent of units), sometimes union (10 percent), and always union (31 percent). We then interact our indicator for non-standardized pay with these static group indicators and estimate the same regressions as in Table 2, leaving all other parts of the model the same.

The results of this exercise in Table A.4 show that the effects are most negative for never-unionized firms. For always-unionized firms, the effects of switching to flexible pay are slightly but insignificantly positive in the most tightly-controlled specifications. The potentially positive effects of flexible pay for union workers is consistent with the finding that, when introducing new pay schemes, management in unionized establishments often had to make concessions (Jacoby and Mitchell, 1986). These results provide further evidence of standardized pay as an important organizational constraint on managerial pay-setting in non-union firms: in unionized firms, unions strengthened worker bargaining power and continued to constrain employers, even in the rare cases when some limited flexible pay-setting was adopted.

5.2 Job growth and standardized pay rate abandonment

Were these wage declines imposed on incumbent workers, or were effects concentrated on new hires? Wage decreases are perceived to have damaging effects on worker morale (Bewley, 1999). Firms abandoning their traditional pay scales may have attempted to circumvent these forces by introducing the new pay systems for new hires, leaving incumbents untouched (Cappelli and Sherer, 1990; Mitchell and Abraham, 1985). In unionized workplaces, these systems were called "two tier" plans (Jacoby and Mitchell, 1986).

Indirectly, the within-job heterogeneity results from the previous section are consistent with this pattern. The lowest paid workers within a job are likely to be the lowest seniority workers, and Figure 7 shows they experienced the largest wage decreases. Although we cannot track individual workers over time, we can provide a further test of this idea by asking whether occupations within a firm were more likely to switch away from standardized pay rates in years when their headcount was growing. If these shifts were part of a new two tier plan, workforces should grow slightly with the adoption of non-standardized pay.

In Table 3 we test this idea with regressions similar to the previous section. We add two

variables at the job-year-establishment level to the build used to estimate the regressions in Table 2: the change in log headcount in that occupation and, as our outcome, an indicator for whether the occupation switched its workers to non-standardized schedules that year, which occurs in 2.5 percent of our observations. In column (1), we include only year controls. In column (2), we add fixed effects for our primary unit of observations, occupation × establishment. In column (3), we add labor market controls and, importantly, control for the size of the establishment—which differs from the number of workers within a job within an establishment, our main variable of interest. Column (4) adds fixed effects for the intersection of year, city, occupation, and industry and column (5) adds firm by occupation by year fixed effects.

[Table 3 about here.]

The results suggest that employment growth in a given occupation is consistently associated with switching away from standardized pay. For instance, the coefficient on job growth is 0.017 in the first regression, suggesting that if an establishment had expanded a certain occupation's headcount by 20 percent in a given year, they were also 0.34 percentage points more likely to place workers onto non-standardized schemes, an 11 percent increase in the chance of switching. This coefficient is stable across regressions, importantly so in column (3), which accounts for establishment size, and in column (5) which adds fixed effects for year by occupation by firm, thus using only within-firm, between-establishment variation. These results suggest that firms switching away from standardized pay rates may not have cut wages for incumbent employees, but instead used managerial discretion to open up a new, lower tier of pay for new hires.

6 Differences in standardized and flexible pay-setting

6.1 Types of wage changes

In addition to evidence on wage changes surrounding switches away from standardized pay rates, we can also use the WFAS to study the kinds of pay changes that occur under standardized vs. flexible regimes. The WFAS includes a 1-year follow-up wage change survey (Change Survey), in which establishments are re-contacted and asked about changes in wages since the first survey wave. In addition to gathering an additional year of wage data, the Change Survey asks the reason for

the pay change. This gives a unique opportunity to study not only quantitative differences in pay levels (as above), but also the qualitative basis on which pay changes.

Table 4 compares the share of each pay change reason across standardized and flexible pay jobs. Standardized rate jobs are more likely to face a general, across-the-board wage change (65%) or an inflation-indexed COLA-based change (12%) than flexible pay jobs (59% for general; 5% for COLA). In lieu of those two types of establishment-wide pay changes, flexible pay setting jobs were more likely to report only pay changes for individual workers (10% vs. 2% for standardized) or no pay increase at all in the last year (22% for flexible; 18% for standardized).

[Table 4 about here.]

These differences are consistent with our interpretation of no range and seniority jobs as characterized by less managerial discretion in pay setting. Flexible pay jobs are less likely to make general wage changes and are less likely to link pay changes to changing cost of living.[6] They are more likely to skip pay increases and more likely to implement individual worker-specific pay changes.

6.2 Wages and firm growth

A final expectation of the use of more flexible and merit-based pay was that these components of pay would be more closely linked to the fates of employers.[7] Anecdotally, firms withheld merit raises when profitability decreased, as when Ford cut merit pay as "a recognition that the future is somewhat uncertain because of weak auto industry sales and slowing economic growth" (Reuters, 1990). In an era of cost pressure on many employers of blue collar workers, strengthening this link could translate into real wage decreases.

In this section, we measure how wages determined through different pay setting techniques correlate with growth in firm headcount, an explicit item recorded in the WFAS (and distinct from the total number of employees in the targeted occupations). Establishment growth in the

[6] This period saw the demise of cost of living adjustments (Devine, 1996; Mitchell and Abraham, 1985). Including the COLA amount in our regression has no impact on our results. We explore the cost of living adjustments and their relationship with inflation in the Online Appendix.

[7] In an article on the growth of these and incentive pay systems, Martin Weitzman opined to the New York Times that "Throughout American labor there is now growing recognition that perhaps it may not be such a bad thing for workers to have some part of their pay tied to the company's profitability...Movements in this direction are good for the economy, because they give companies an incentive to lay off fewer workers in bad times and take on more workers in good times" (Prokesch, 1985).

model with fixed effects is arguably our best proxy for performance. Recent studies show that firms grow with profits (Kline et al., 2019), although the link to performance and profitability is debated (Coad and Hölzl, 2012). We document below that workers benefit from employment increases, so at a minimum our results can measure the extent to which this differs across workers.

Table 5 shows similar regression results to the previous analysis with a focus on the interaction of non-standardized pay rates with ln(establishment size). If workers under flexible pay setting are more exposed to firm size dynamics, this interaction should be positive once accounting for establishment fixed effects. We first show, in column (1), that the main effect of establishment size estimated in a regression with only year fixed effects and institutional controls is very similar to estimates of the size-wage premium using other matched worker-establishment data covering U.S. manufacturing firms (Troske, 1999). The premium is not significantly different for the workers under flexible pay.

[Table 5 about here.]

Next, in column (2), we show the same wage regressions with year and establishment-by-job fixed effects. The main effect of establishment size shows that wages increase 0.8 percent for every 1 percent increase in establishment size once accounting for establishment fixed effects, which are included so that between-firm comparisons do not contribute to the estimation of the coefficient. Adding the interaction term with non-standardized pay rates to the main effect suggests a 1.2 percent increase for non-standardized pay workers; about 50 percent larger than the effect for standardized pay rate workers.

As we tighten the controls, the interaction coefficient is consistently positive, suggesting an establishment size effect that is 30-75 percent larger for workers in non-standardized rate jobs. Column (3) adds back in the institutional controls from column (1), with little change in the interaction and main effect. Column (4) includes a fixed effect for year-city-industry-occupation to address omitted labor market factors, attenuating the interaction effect somewhat. Finally, column (5) includes firm-year-occupation fixed effects, thus restricting the identifying variation to workers at different establishments in the same job, firm, and time period. The interaction term in this case is larger although imprecisely measured. Overall, these analyses suggest that employers without standardized rate wages maintained tighter links between pay changes and firm size dynamics.

7 Robustness tests

7.1 Alternative weighting schemes

We weight each job (establishment by occupation) as one equal unit. However, the WFAS data also include information on the number of employees in each surveyed job and wage bracket. An alternative approach to analysis is to weight by the number of employees represented by each wage observation. This weighting approach substantially upweights jobs with many employees and downweights jobs with few employees. In these data, weighting by the number of employees places 54 percent of the weight on the top 5 percent largest jobs (those with at least 31 workers). The data also include survey weights, which we do not use in the main results due to lack of documentation about how they are constructed. Finally, we can reweight the data in proportion to the industry and occupation cells in the Current Population Survey (Flood et al., 2020).

In Table A.2 in the appendix, we assess the robustness of our results to these alternative weighting options, by weighting with first the number of employees in a job and then the survey weights. The results are largely consistent with the job-weight results presented in the main tables. The exception is the employee-weighted job-by-establishment fixed effect model. This is driven entirely by the large jobs (above 31 workers) that make up 5 percent of the observations but 54 percent of the employment-weighted sample. Table A.2 shows that excluding those observations yields estimates similar to the other weighting schemes.

7.2 Alternative operationalizations of pay methods

In the main results, we define flexible pay as pay variation due to pure merit; a combination of merit and seniority; or other, non-seniority reasons for pay variation. All of these survey responses indicate managerial discretion and potentially individualized pay. However, other reasonable approaches would be to exclude other, non-seniority reasons for pay variation or exclude combination systems from the definition of merit pay. Table A.3 shows that this coding decision has little impact on the wage effect estimates: flexible or non-standardized pay effects are consistently negative across variable definitions.

8 Conclusion

We study changing pay practices for blue-collar workers during a period of wage stagnation in the 1970s and 1980s. During this period, the employers in our data, selected among establishments employing blue-collar workers, switched steadily from standardized to flexible pay-setting practices. In 1974, around three quarters of blue-collar jobs were covered by standardized pay rates, determined as either a single rate for a job title or varying only with seniority. By 1991, only half of jobs in our sample were covered by standardized rates; the remainder allowed some managerial discretion in pay-setting, like merit-based pay changes.

Wage stagnation and the decline of standardized pay rates were closely linked. Even conditional on controls for the dominant explanations for wage stagnation, and when analyzed in an event study, flexible, compared to standardized, pay setting is associated with lower wages. The magnitude of this effect varies across models. Aggregating up, the shift in pay-setting practices means that changing pay-setting can account for as little as 1% or as much as one fifth of the real wage decline for non-trades blue-collar workers during this period.

Why were wage stagnation and the decline of standardized pay rates correlated? We argue that during an era of declining bargaining power for blue collar workers, employers using standardized rates had committed to higher pay for their workers. Switching to more flexible pay-setting allowed lower pay for some workers, opening a new second tier of lower wages, likely for new hires. We find that when employers abandoned standardized pay rates, pay scales widened downward, the lowest real wages within a job declined, and the lowest paid jobs had the largest pay decline. Consistent with this lower pay mainly affecting new hires, we find that employment increases in a job around the switch to flexible pay.

Moreover, the negative wage effects of switching away from standardized pay are concentrated in previously high-paying blue-collar employers. Flexible pay penalties are also concentrated in non-union firms, and the rise of flexible pay was strongly correlated with the decline of labor unions across local labor markets. The erosion of these organizational constraints on pay-setting allowed high-paying, non-union employers to adjust their wages downward toward their competitors.

This heterogeneity in flexible pay effects tracks the key inequality dynamics found in this period using administrative data: an increase in inequality inside large firms and diminished firm pay

premiums at employers of low- and middle-skilled workers (Song et al., 2018). The effects of standardized pay that we document are also micro-level evidence that institutions contributed to the deviation of non-college workers' wages above the level predicted by a supply and demand model in the late 1970s and early 1980s (Goldin and Katz, 2008). By removing an organizational constraint that propped up elevated wages during a period of weakening blue-collar worker bargaining power, the decline of standardized pay rates undermined access of low-skill workers to firm pay premiums. However, these changes in pay policies were not necessarily an ultimate cause of wage stagnation; they likely reflected broader trends, offering a way for employers to capitalize on decreased worker power.

Beyond studying effects of the switch away from standardized pay, we also provide evidence on how pay-setting differs between standardized and flexible pay setting. Employers using flexible pay-setting are less likely to give pay increases in response to cost of living changes, and more likely to make pay adjustments only for individual workers. We also find that in standardized pay establishments, wage changes varied less with employment changes at firms with standardized pay. Together, these findings suggest that blue-collar wage-setting during this period became less responsive to the cost of living, more differentiated across individual workers, and more responsive to the performance of employers—many of whom were in declining industries.

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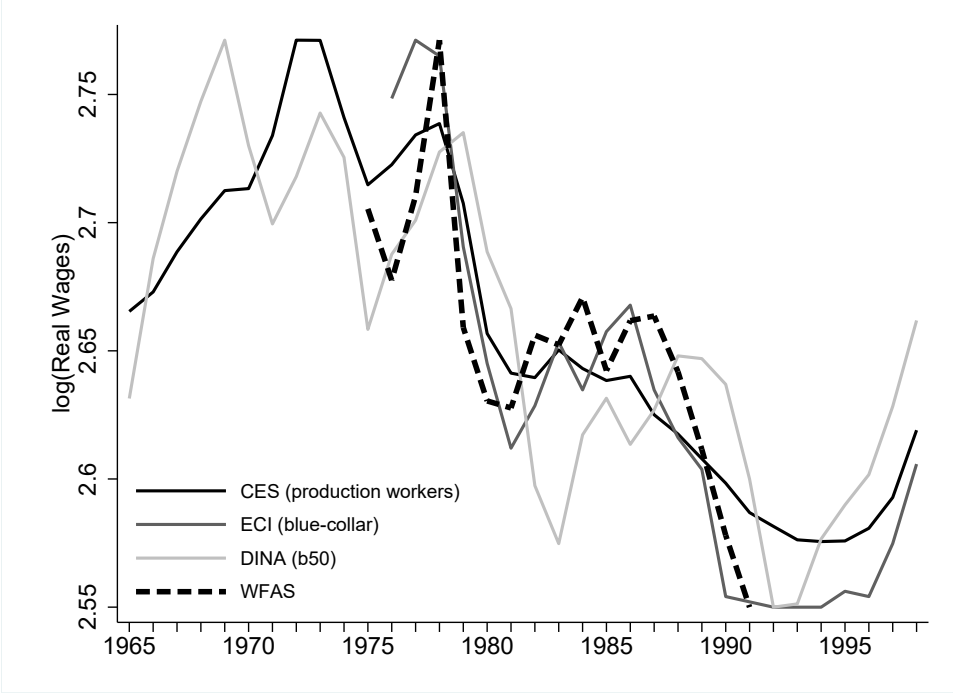
Figure 1: Pay Stagnation Across Data Sources, 1974-1991

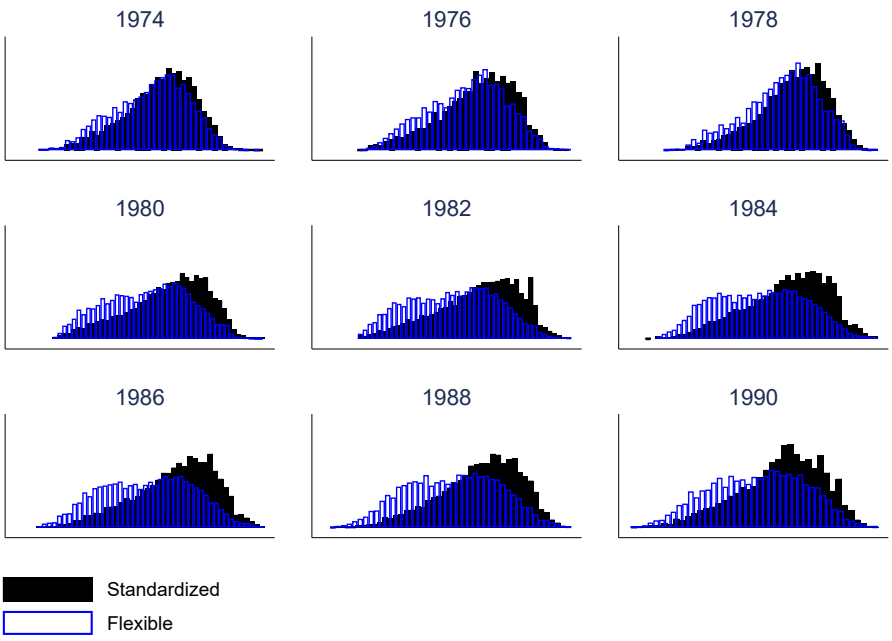


Note: CES is real hourly production worker wages from BLS's Current Employment Survey (US BLS, 2015). ECI is Employer Cost Index for blue-collar workers, which covers base pay, bonuses and benefits including health, retirement and leave (US BLS, 2013). DINA is Distributional National Accounts average labor income for the bottom 50 percent of workers (Piketty, Saez and Zucman, 2020). All series are placed on separate y-axes to reveal similarity in change over time. The axis shown is for CES series. All series are deflated using non-chained CPI-U.

Figure 2: The Decline of Standardized Pay Rates, 1974-1991

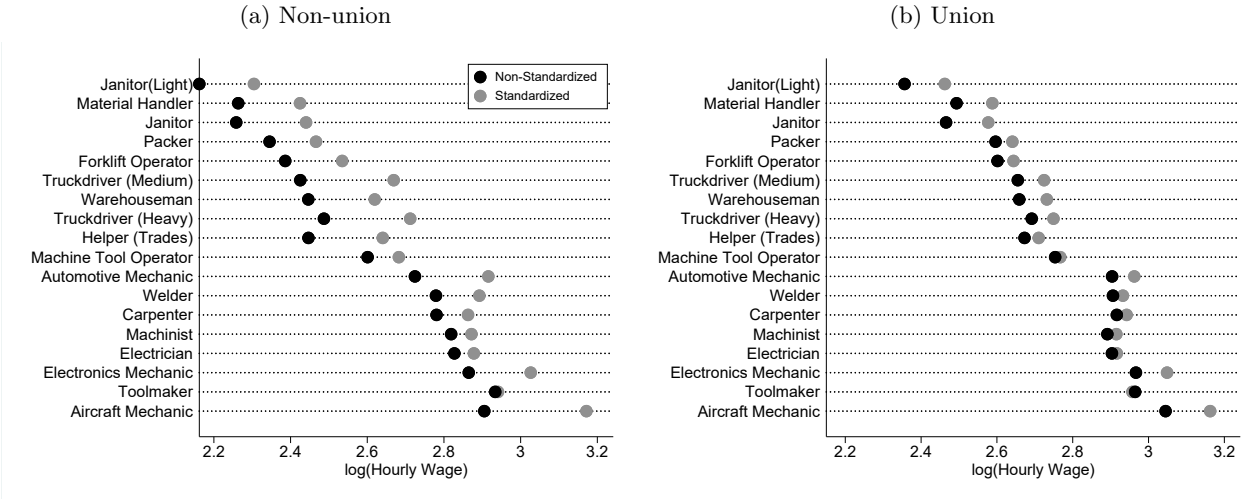
Note: Seniority is defined as jobs with pay variation due only to seniority. No range is jobs with no within-job pay variation. Flexible is defined as firms that use merit, a combination of seniority and merit or other methods besides seniority or single-wage for determining variation in pay within job titles. Source is Wage Fixing Authority Survey.

Figure 3: Wage distributions for standardized rate and flexible pay, 1974-1991



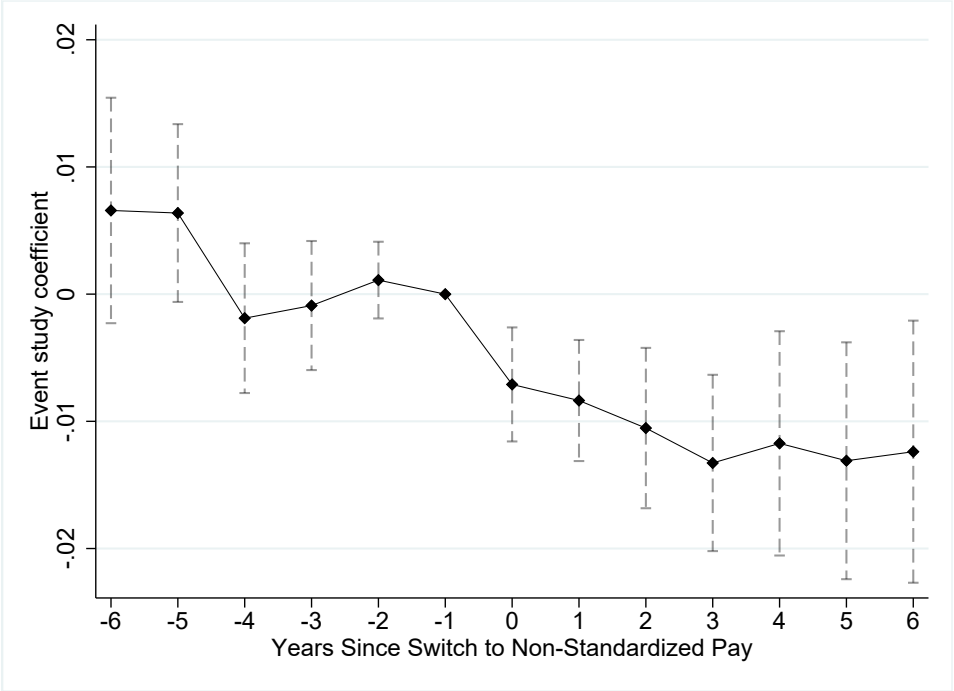
Note: Flexible pay is defined as firms that use merit, a combination of seniority and merit or other methods besides seniority or single-wage for determining variation in pay within job titles. Standardized rate pay includes pay set according to seniority or as a single-wage for the job title. Source is every other year of data from the Wage Fixing Authority Survey.

Figure 4: Wage Levels by Pay Practices



Note: Only the most common occupations in the WFAS displayed. Source is Wage Fixing Authority Survey. For some occupations, the Federal Wage System Job Grading System (OPM, 1981) distinguishes between heavy, light and medium versions, based on task and responsibility differences idiosyncratic to each occupation. For example, "Janitor (light)" involves sweeping and polishing floors, cleaning that doesn't involve ladders, and lifting objects up to 10 pounds. "Janitor (heavy)" adds stain removal, heavy furniture moving, cleaning that does involve a ladder and lifting objects up to 20 pounds.

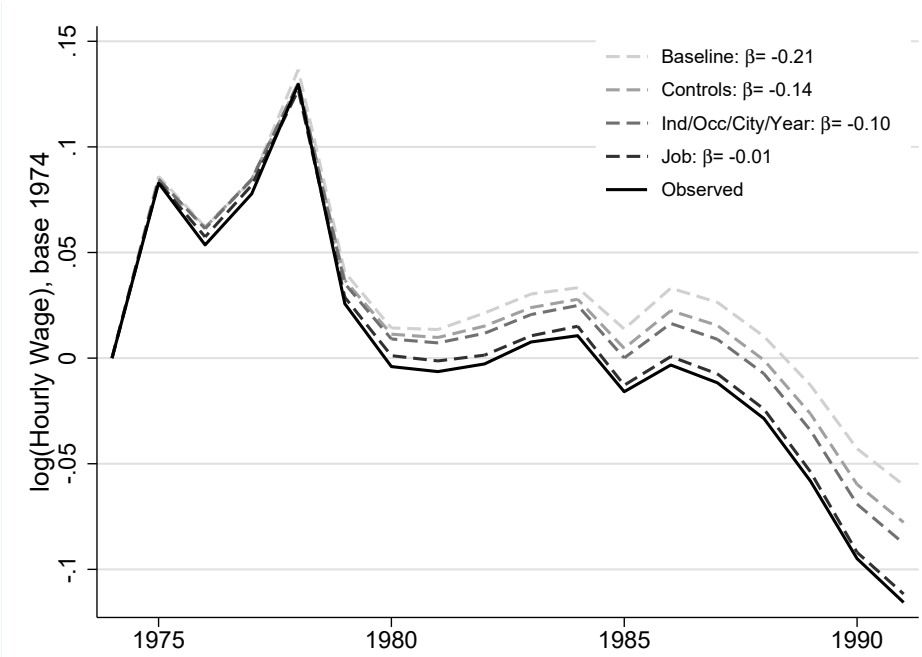
Figure 5: Wage Trajectory Following Switch to Non-Standardized Pay Rates



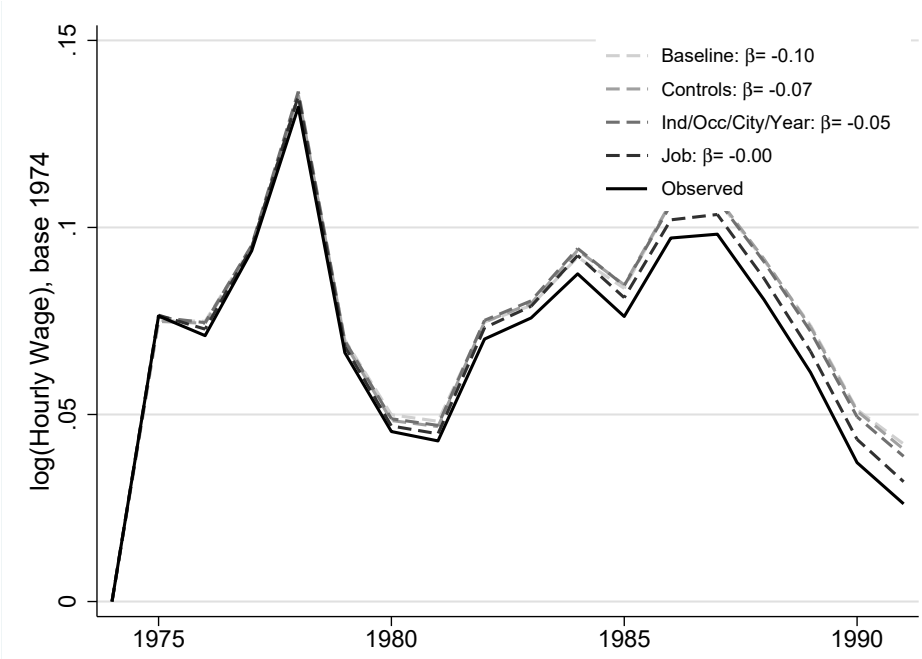
Note: Event is defined as switching from standardized pay rates. Dots show point estimates and dashed lines show 95% confidence intervals for event study coefficients in Equation 2. The omitted period is -1. Job-establishment panels are required to include at least two observations before and after the pay practice switch. Event time is binned at -6 and 6. Controls include firm size and year by labor market by industry by occupation fixed effects. Source: WFAS.

Figure 6: Decomposing Wage Trends, 1974-1991

(a) Non-trades Workers

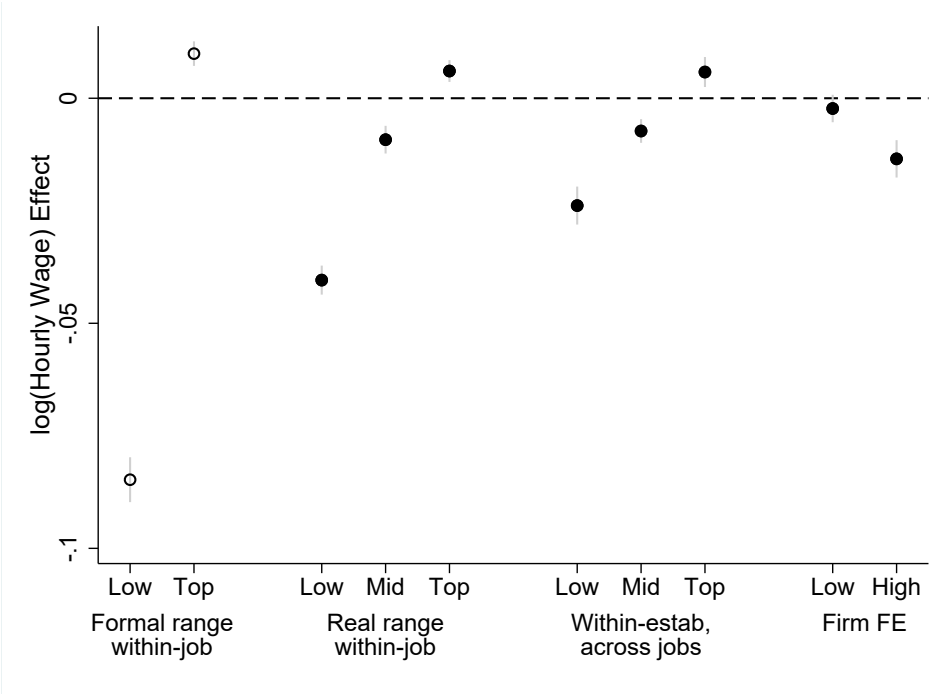


(b) Skilled Trades workers



Note: We distinguish trades from non-trades jobs based on whether jobs are above job level 8 in the 1981 Federal Wage System Job Grading System (OPM, 1981). This level cut-off roughly operationalizes the difference between blue collar jobs that require a formal apprenticeship and blue collar jobs that do not. Non-trades jobs include maintenance laborers, food service workers, forklift operators, helpers, janitors, packers, truck drivers, material handlers, and warehouse workers. Trades include plumbers, electricians, carpenters, welders, toolmakers and mechanics. Data are from Wage Fixing Authority Survey.

Figure 7: Wage Effects of Abandoning Standardized Pay Rates



Note: Estimates are wage differences associated with switching away from standardized pay, controlling for controls, job by establishment fixed effects and year by city by industry and job fixed effects as in column (4) in Table 2. Source is Wage Fixing Authority Survey.

Table 1: Descriptive Statistics

	Standardized Pay Rates				Non-Standardized/Flexible			
	Mean	SD	p(10)	p(90)	Mean	SD	p(10)	p(90)
Real Hourly Wages	8.76	3.62	4.44	13.72	7.91	3.41	4.12	12.70
log(Real Hourly Wages)	2.76	0.32	2.30	3.13	2.59	0.36	2.09	3.04
Workers at Pay Level	11.74	46.42	1.00	24.00	7.40	29.75	1.00	15.00
log(Workers at Pay Level)	1.36	1.28	0.00	3.18	0.91	1.18	0.00	2.71
Workers in Job	15.08	61.76	1.00	30.00	12.06	44.37	1.00	25.00
log(Workers in Job)	1.56	1.33	0.00	3.40	1.47	1.23	0.00	3.22
Workers in Est.	1188.49	4527.88	80.00	2326.00	1020.39	3236.28	70.00	2057.00
log(Workers in Est.)	5.99	1.31	4.38	7.75	5.84	1.33	4.25	7.63
Collective Bargaining	0.47	0.50	0.00	1.00	0.21	0.41	0.00	1.00
Share Office in Est.	0.33	0.21	0.11	0.66	0.40	0.25	0.12	0.81
Co-Workers' Occ. Level	2.65	0.16	2.44	2.84	2.61	0.18	2.36	2.83
Share Union, Ind.-Wage Area	0.44	0.44	0.00	1.00	0.22	0.36	0.00	1.00
Minimum Wage	2.96	0.59	2.02	3.35	3.09	0.52	2.30	3.35
log(Minimum Wage)	1.74	0.16	1.58	1.88	1.72	0.14	1.55	1.88
Share with Bonus	0.16	0.37	0.00	1.00	0.16	0.37	0.00	1.00
Share with Piece Rate	0.00	0.01	0.00	0.00	0.01	0.11	0.00	0.00
Share with COL Adj.	0.21	0.40	0.00	1.00	0.09	0.28	0.00	0.00
Observations	465300				435366			

Note: Data are Wage Fixing Authority Survey. Merit and piece rate are dummies indicating whether the job is under the given pay practice. Bonus and COL (cost of living) adjustment are dummies indicating whether the job had non-zero compensation from those categories.

Table 2: Wage Effects of Non-Standardized Pay Rates

	(1)	(2)	(3)	(4)	(5)
Non-standardized Pay	-0.145	-0.108	-0.077	-0.008	-0.010
	(0.003)	(0.003)	(0.002)	(0.001)	(0.004)
log(Workers at Pay Level)	0.044	0.040	0.034	0.013	0.012
	(0.002)	(0.001)	(0.001)	(0.000)	(0.001)
log(Workers in Est.)	0.050	0.048	0.040	0.014	0.012
	(0.001)	(0.001)	(0.001)	(0.002)	(0.004)
log(Workers in Job)	-0.016	-0.023	-0.012	-0.016	-0.013
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
log(Minimum Wage)	0.085	0.075	0.001	0.010	-0.001
	(0.011)	(0.010)	(0.010)	(0.004)	(0.005)
Collective Bargaining		0.034	0.021	0.002	-0.003
		(0.004)	(0.003)	(0.002)	(0.003)
Share Managerial, Clerical in Est.		0.018	-0.008	-0.002	-0.018
		(0.006)	(0.005)	(0.004)	(0.011)
Co-Workers' Occupational Level		0.556	0.262	0.006	0.002
		(0.008)	(0.006)	(0.004)	(0.008)
Union Density in Industry-Wage Area		0.049	0.030	-0.002	0.008
		(0.005)	(0.004)	(0.002)	(0.006)
Constant	2.206	0.742	1.760	2.608	2.643
	(0.021)	(0.029)	(0.023)	(0.018)	(0.033)
Fixed effects:					
Year	×	×			
Year X City X Ind. X Occup.			×	×	×
Occup. X Establishment				×	×
Year X Occup. X Firm					×
Observations	900359	852024	829626	769166	535106

Note: The outcome in all columns is logged hourly wages. Each observation is an establishment-by-occupation-by wage level. Each observation is weighted by the inverse number of rows within each establishment-by-occupation, to weight jobs with more or fewer wage levels equally. Non-standardized pay is operationalized as a job-level dummy variable for pay that is not fixed by seniority or job title, but rather varies with merit, merit and seniority, or other determinants. Columns 1 – 3 show non-standardized pay effects under increasingly stringent controls for differences by job, firm and local labor market. Column 4 adds establishment-by-occupation fixed effects to show wage changes associated with a job switching away from standardized pay. Column 5 adds firm by occupation by year fixed effects, to identify changes idiosyncratic to some establishments in multi-establishment firms. The sample size varies across models due to exclusion of singletons from fixed effects regressions. The standard errors (in parentheses) are robust and clustered at the establishment level. Jobs covered in the sample are blue collar jobs in trades and non-trades occupations. The data source is the Wage Fixing Authority Survey.

Table 3: Occupation growth and Switching to Non-Standardized Pay

	(1)	(2)	(3)	(4)	(5)
Log(Job Growth)	0.017	0.019	0.018	0.016	0.014
	(0.002)	(0.002)	(0.002)	(0.002)	(0.007)
Collective Bargaining			0.004	0.003	0.003
			(0.005)	(0.005)	(0.005)
Share Managerial, Clerical in Est.			0.026	0.021	0.012
			(0.010)	(0.011)	(0.008)
Co-Workers' Occupational Level			0.016	0.019	-0.064
			(0.013)	(0.014)	(0.049)
Union Density in Industry-Wage Area			-0.000	0.007	0.000
			(0.006)	(0.006)	(0.008)
log(Minimum Wage)			0.058	0.047	0.001
			(0.010)	(0.012)	(0.001)
log(Workers in Est.)			-0.002	0.003	0.007
			(0.004)	(0.004)	(0.010)
Constant	0.117	0.123	-0.024	-0.111	0.178
	(0.009)	(0.014)	(0.050)	(0.051)	(0.148)
Fixed effects:					
Year	×	×	×		
Year X City X Ind. X Occup.				×	×
Occup. X Establishment		×	×	×	×
Year X Occup. X Firm					×
Observations	529877	472847	448643	430438	318399

Note: The outcome in all columns is an indicator for switching to non-standardized pay. Non-standardized pay is operationalized as a job-level dummy variable for pay that is not fixed by seniority or job title, but rather varies with merit, merit and seniority, or other determinants. The key independent variable is the year-to-year change in logged employees in each establishment-by-occupation job. Each observation is an establishment-by-occupation-by wage level. Each observation is weighted by the inverse number of rows within each establishment-by-occupation, to weight jobs with more or fewer wage levels equally. Column 1 shows the association between job growth and switching to non-standardized pay cross-sectionally. Columns $2-5$ show include establishment-by-occupation fixed effects, to show the within-panel association of increases in job growth and standardized pay, and progressively layers in a series of other controls for differences by job, firm and local labor market. The sample size varies across models due to exclusion of singletons from fixed effects regressions. The standard errors (in parentheses) are robust and clustered at the establishment level. Jobs covered in the sample are blue collar jobs in trades and non-trades occupations. The data source is the Wage Fixing Authority Survey.

Table 4: Types of Pay Changes in Standardized Pay vs. Flexible Jobs

	Standardized pay rate jobs	Flexible pay jobs
General change	0.64	0.59
COLA	0.12	0.05
Only individual	0.02	0.10
No change	0.18	0.22
Bonus, incentive	0.03	0.02
Other	0.01	0.02

Note: The data source is from the Change Survey subsample of the Wage Fixing Authority Survey. The Change Survey component returns to establishments one year after the initial survey collection. The categories listed are different reasons offered in the survey for pay changes in the year since the base period survey. General wage changes are across-the-board nominal wage increases or decreases. COLA changes are increases tied directly to the consumer price index. Only individual changes occur when there are only merit- or seniority-based wage increases, but no general wage change or COLA change. No change is when there is no change in pay during the year period. Bonus and incentive changes are when there are no base pay increases, but some bonus or piece rate adjustment made. The columns show the share of jobs covered in the Change Survey that report each type of change, divided between jobs covered by standardized pay rates and jobs covered by flexible or non-standardized pay rates. Non-standardized pay is operationalized as a job-level dummy variable for pay that is not fixed by seniority or job title, but rather varies with merit, merit and seniority, or other determinants. Standardized pay jobs are those with pay fixed by seniority or job title.

Table 5: Differences in Size Premiums in Standardized Pay Jobs

	(1)	(2)	(3)	(4)	(5)
Non-standardized Pay	-0.173	-0.039	-0.038	-0.027	-0.051
	(0.013)	(0.006)	(0.007)	(0.006)	(0.019)
Non-Standardized * Log(Estab. size)	0.002	0.004	0.004	0.003	0.006
	(0.002)	(0.001)	(0.001)	(0.001)	(0.003)
Log(Estab. size)	0.061	0.008	0.008	0.010	0.008
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Other regressors:					
Controls	×		×	×	×
Year	×	×	×		
Year X City X Ind. X Occup.				×	×
Occup. X Establishment		×	×	×	×
Year X Occup. X Firm					×
Observations	900370	838204	791404	769166	535106

Note: The outcome in all columns is logged hourly wages. Each observation is an establishment-by-occupation-by wage level. Each observation is weighted by the inverse number of rows within each establishment-by-occupation, to weight jobs with more or fewer wage levels equally. Non-standardized pay is operationalized as a job-level dummy variable for pay that is not fixed by seniority or job title, but rather varies with merit, merit and seniority, or other determinants. Non-standardized pay is interacted with total headcount by establishment-year. Additional controls, included in Columns 1 and 3-5 are establishment-level collective bargaining, establishment-level share of office workers out of total employees, average occupational level of blue collar co-workers, industry-city level union density and state-level minimum wage. Column 1 shows the association between wages, establishment size, and non-standardized pay cross-sectionally. Columns 2-5 add establishment-by-occupation fixed effects and progressively layer in additional controls. The sample size varies across models due to exclusion of singletons from fixed effects regressions. The standard errors (in parentheses) are robust and clustered at the establishment level. Jobs covered in the sample are blue collar jobs in trades and non-trades occupations. The data source is the Wage Fixing Authority Survey.