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

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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. (*JEL* J31, J33, J52, M52, O33)

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 noncollege 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

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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 Werner 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 coworkers (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 (Bloom and Van Reenen 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 2007). 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 noncollege 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 microdata 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 United States 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 nonunion 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 downward 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 targeted 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 nonstandardized 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 nonstandardized 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 nonstandardized 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 nontrades blue-collar workers, the decline in standardized pay accounts for as little as 1 percent and as much as 20 percent 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 2020b). First, we find that industry-regions with the largest declines in unionization saw larger increases in the use of nonstandardized 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. 2019). 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 nonstandardized 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[1] (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

[1] Prokesch, Steven. 1985. "Companies Turn to Incentives." *New York Times*, July 19. D4.

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. 2019). 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 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 ask 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 1980a; 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.

I. 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 (Milkovich and Wigdor 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, 171–72). 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.[2] One nonunion firm had a more regimented system: "The review last November … was just merit. The merit budget was 2.3 percent, with employees

[2] *Grove v. Frostburg Nat. Bank*, 549 F. Supp. 922 (D Md. 1982).

getting either 1 percent, 2 percent or 3 percent" (Foulkes 1980, 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 nonunion employers, who had previously adopted many bureaucratic employment practices to avoid the threat of union organizing (Foulkes 1980). Technological change and rising import competition 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, Barankay, and Rasul 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).

II. 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 United States (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 that 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 2020b) and the May Extracts from 1974 to 1982 (NBER 2020a). We matched WFAS and CPS data at the level of occupation, year, region, and broad industry. Online Appendix 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 online Appendix Figure A.2).[3] If a job is governed by a single formal pay scale, this scale is also reported (see line 15 in online Appendix Figure A.2). Alongside that scale, the data include a question asking each employer about the

[3] 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.

Table 1—Descriptive Statistics

	Standardized pay rates				Nonstandardized/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.	1,188.49	4,527.88	80.00	2,326.00	1,020.39	3,236.28	70.00	2,057.00
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
Coworkers' 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	465,300				435,366			

Notes: 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 nonzero compensation from those categories.

Source: Data are Wage Fixing Authority Survey.

basis for wage differences within job categories. Respondents can choose none (for no within-job variation) (39 percent), longevity (tenure) (25 percent), merit (13 percent), a combination of merit and longevity (16 percent), or other (6 percent) (see line 16 in online Appendix 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 nonstandardized 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 percent of the sample) and for whether a job receives a production bonus (16 percent). Table 1 summarizes descriptive statistics for the data.

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 United States. Online Appendix Figure A.3 shows that the largest portions of the sample come from heavy industry, but a variety of light industry, transportation, and wholesaling firms 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. Online Appendix Figure A.4 shows the largest employers in the WFAS, which include a number of household names, from General Electric to United Airlines to

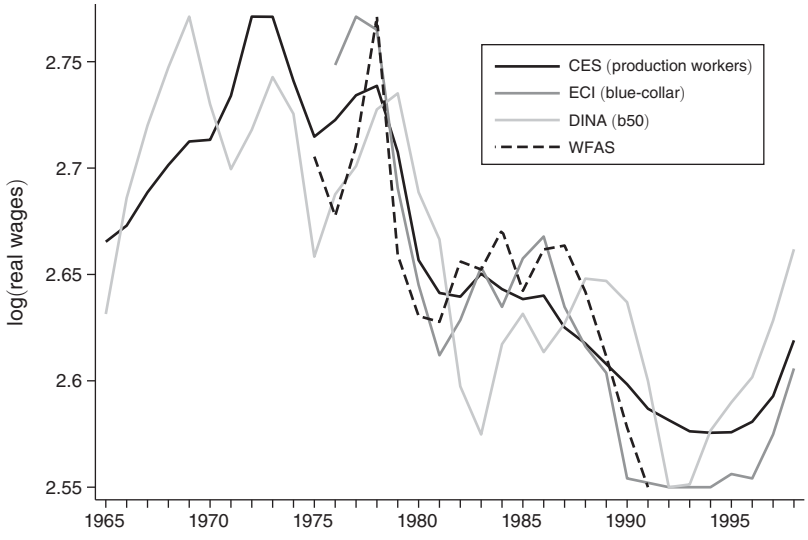

FIGURE 1. PAY STAGNATION ACROSS DATA SOURCES, 1974–1991

Notes: 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 nonchained CPI-U.

Source: CES is real hourly production worker wages from BLS's Current Employment Survey (US BLS 2015).

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 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. Online Appendix 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.[4]

III. Descriptive Evidence on the Decline of Standardized Pay Rates

Figure 1 plots real wage trends from several different data sources.[5] The Bureau of Labor Statistics (BLS) Current Employment Statistics (CES) production workers

[4] 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.

[5] 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.

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 nonwage benefits, so some commentators attribute wage stagnation to a trade-off between wage and nonwage 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 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 percent during the 1970s and 1980s, and this pattern is mirrored in our data.

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 nonstandardized 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.

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. Online Appendix 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. Online Appendix Figure A.7 shows that simultaneous to the decline of

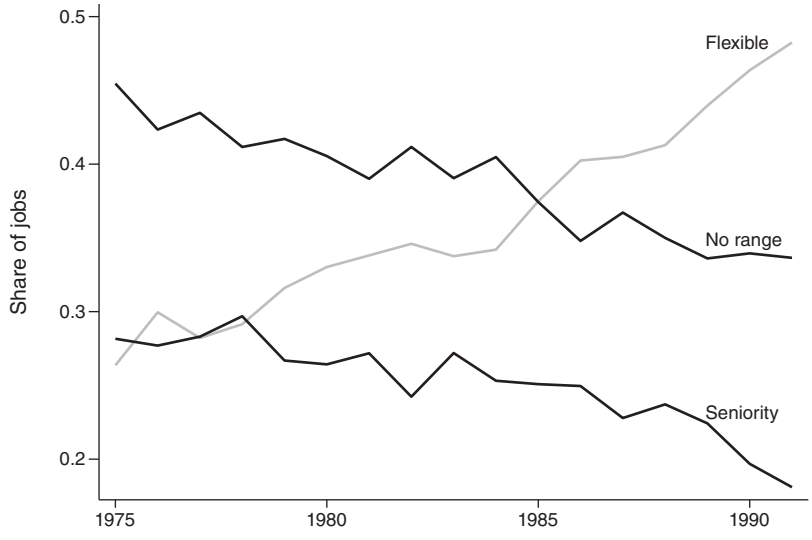

FIGURE 2. THE DECLINE OF STANDARDIZED PAY RATES, 1974–1991

Notes: "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: Wage Fixing Authority Survey

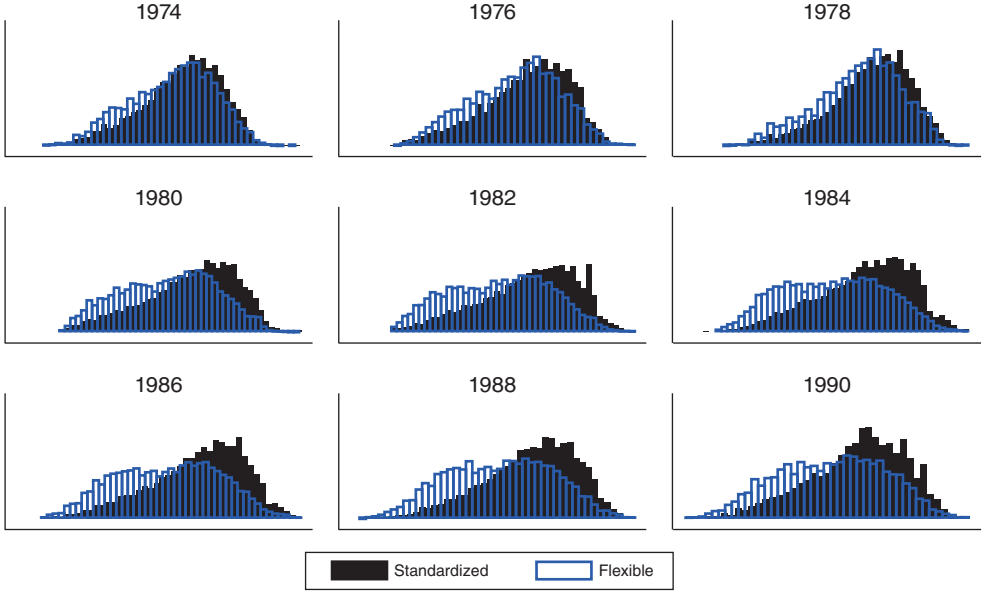

FIGURE 3. WAGE DISTRIBUTIONS FOR STANDARDIZED RATE AND FLEXIBLE PAY, 1974–1991

Notes: 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: Every other year of data from the Wage Fixing Authority Survey.

standardized pay rates, the width of formal pay brackets increased steadily, roughly doubling from 1974 to 1991. This widening affected both building trades (like pipe fitters and carpenters) and nontrades 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.

Online Appendix Figure A.8 provides more detail on which kinds of establishments abandoned standardized rate pay. Nonunion 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 nonunion, 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 demonstrate 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) who are unionized and under flexible pay for each time period, then take the long difference. The binned scatterplot in online Appendix 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 nonstandardized 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.[6] The sparse data on

[6] 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"

rates of flexible pay setting of this kind—entirely drawn from infrequent surveys from compensation consulting firms, cited above—also suggest an increase in managerial discretion in pay setting during this period (Heneman and Werner 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 nonunion 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 percent to 30 percent penalties for workers not paid under standardized rates. Higher-paid occupations, like those in the building trades, face a smaller nonstandardized rate penalty than lower-paid occupations, like maintenance laborers and warehouse packers. These penalties are also larger among nonunion 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.

IV. Wage Changes and the Decline of Standardized Pay Rates

A. *Job Fixed Effects Regressions*

We use the following wage equation to estimate the effect of nonstandardized 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 in Section II, each distinct hourly wage, which we index by c, constitutes a different row in the data with its own reported head count. Throughout all models standard errors are clustered at the establishment level.

We include a vector of controls X'_{itc}. In all specifications this includes the three measures of head count 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. We also try to address several competing explanations for shifting wage determination during the period. Prior research identifies

(Lemieux, MacLeod, and Parent 2009, 17). The WFAS merit data provides an alternative approach to tracking performance-related pay that is more relevant for hourly workers.

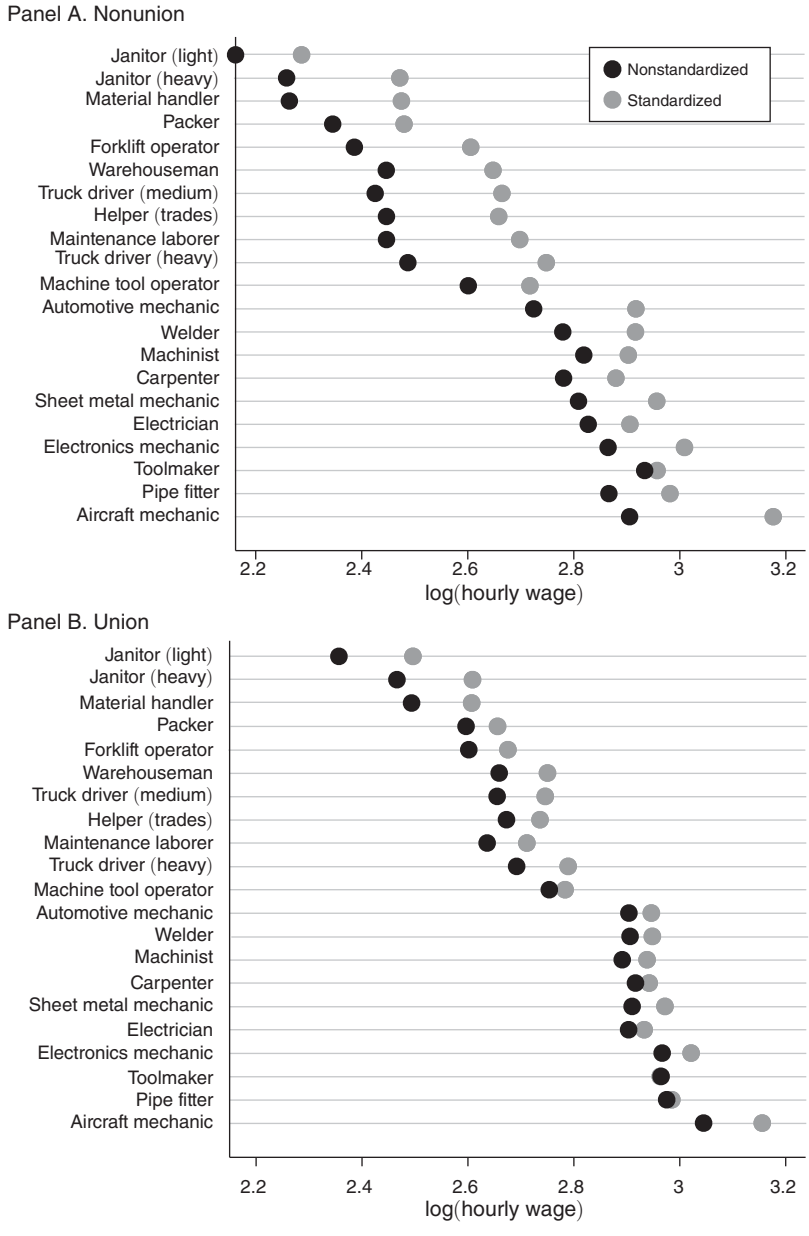

FIGURE 4. WAGE LEVELS BY PAY PRACTICES

Notes: Only the most common occupations in the WFAS are displayed. 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 ten pounds. "Janitor (heavy)" adds stain removal, heavy furniture moving, cleaning that does involve a ladder, and lifting objects up to 20 pounds.

Source: Wage Fixing Authority Survey

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 nonunion employers to embrace standardized, nonmerit 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 noncollege 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 nonstandardized 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 coworkers' 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 that 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.

Table 2—Wage Effects of Nonstandardized Pay Rates

	(1)	(2)	(3)	(4)	(5)
Nonstandardized 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 Establishment)	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 Establishment		0.018	−0.008	−0.002	−0.018
		(0.006)	(0.005)	(0.004)	(0.011)
Coworkers' 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 × City × Individual × Occupation			×	×	×
Occupation × Establishment				×	×
Year × Occupation × Firm					×
Observations	900,359	852,024	829,626	769,166	535,106

Notes: 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. Nonstandardized 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 nonstandardized 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 multiestablishment 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 nontrades occupations.

Source: The data source is the Wage Fixing Authority Survey.

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

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 multiestablishment 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.

B. *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 vector 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 be tracked across survey waves.) The vector 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 resampled 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 online Appendix 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 percent. The sharpness of the change suggests that standardized pay rates are not

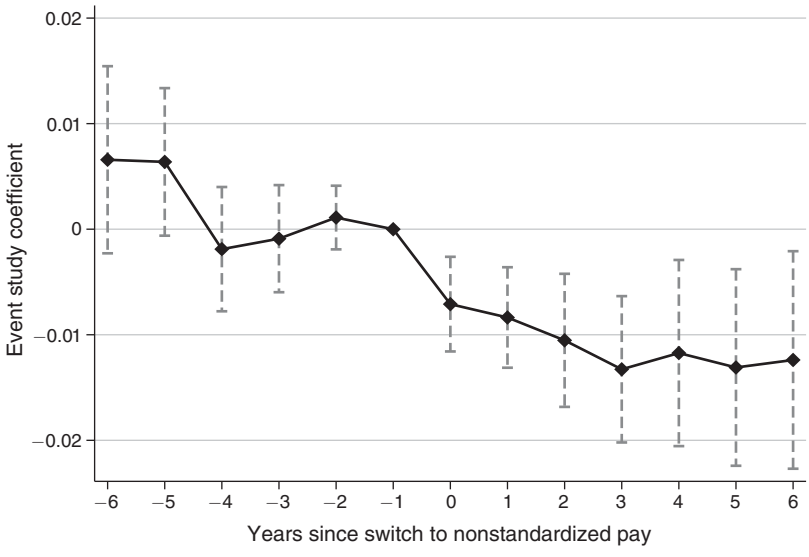

FIGURE 5. WAGE TRAJECTORY FOLLOWING SWITCH TO NONSTANDARDIZED PAY RATES

Notes: Event is defined as switching from standardized pay rates. Dots show point estimates, and dashed lines show 95 percent 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: Wage Fixing Authority Survey

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.

In online Appendix 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 online Appendix 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 six to four years before and after the switch since the number of switchers decreases substantially (see column 3 in online Appendix 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.

C. *Decomposing Wage Stagnation*

The previous analysis estimates pay decreases associated with the decline of standardized pay rates. Next, we quantify the contribution that these decreases 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 nonstandardized 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 nonstandardized rate pay penalty.

Figure 6 compares the resulting counterfactual trends to the observed real wage decline. We separate trends for nontrades 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.[7] Nontrades workers experience declines of around 30 percent from the 1978 peak, while the wages of workers in trades occupations only fell 10 percent. For nontrades workers, retaining standardized pay rates accounts for between 20 percent and 1 percent of their real wage decline. For trades workers, retaining standardized pay rates accounts for between 16 percent and 4 percent of their smaller decline.

The magnitude of real wage reductions associated with the decline of standardized rate pay is thus dependent on model specification but ranges from a small share to a significant supplementary source of wage stagnation during 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.

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

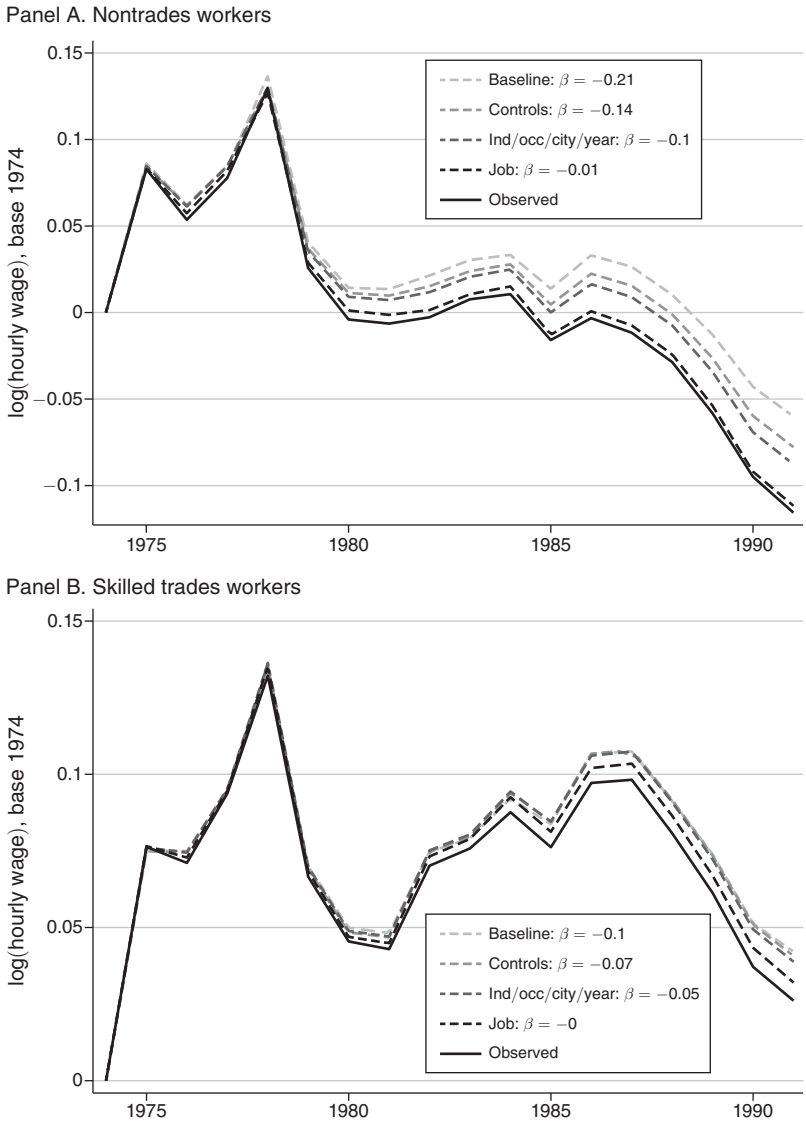

FIGURE 6. DECOMPOSING WAGE TRENDS, 1974–1991

Notes: We distinguish trades from nontrades jobs based on whether jobs are above job level 8 in the 1981 Federal Wage System Job Grading System (OPM 1981). This level cutoff roughly operationalizes the difference between blue-collar jobs that require a formal apprenticeship and blue-collar jobs that do not. Nontrades 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.

Source: Data are from Wage Fixing Authority Survey.

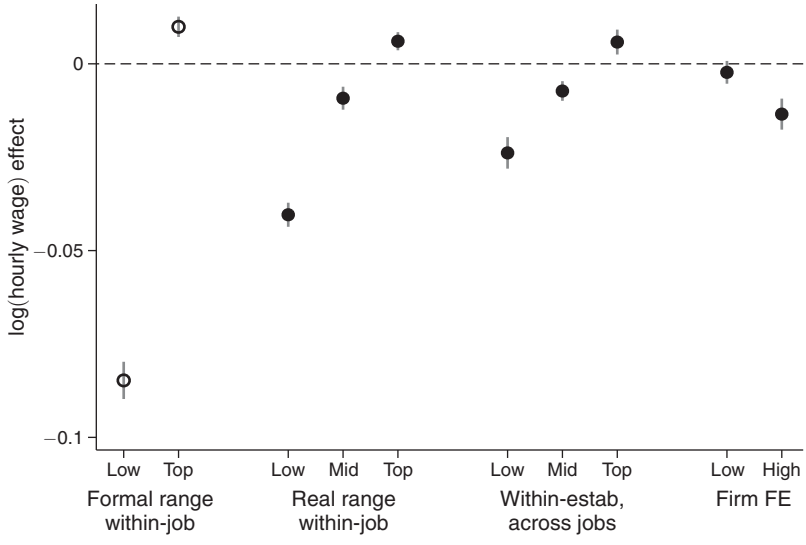

FIGURE 7. WAGE EFFECTS OF ABANDONING STANDARDIZED PAY RATES

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 of Table 2.

Source: Wage Fixing Authority Survey

V. Mechanisms and Heterogeneity

A. *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.

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 percent, or around 4 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 percent 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 coworkers in the same job, as well as between jobs, within establishments.

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 who 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, nonstandardized pay had different wage consequences in establishments with unions, which often resisted these changes (Balkin 1989). We run 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 nonstandardized 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 online Appendix 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 nonunion 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.

B. *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 head count was growing. If these shifts were part of a new two-tier plan, workforces should grow slightly with the adoption of nonstandardized 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 head count in that occupation and, as our outcome, an indicator for whether the occupation switched its workers to

Table 3—Occupation Growth and Switching to Nonstandardized 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 Establishment			0.026	0.021	0.012
			(0.010)	(0.011)	(0.008)
Coworkers' 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 Establishment)			−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 × City × Individual × Occupation				×	×
Occupation × Establishment		×	×	×	×
Year × Occupation × Firm					×
Observations	529,877	472,847	448,643	430,438	318,399

Notes: The outcome in all columns is an indicator for switching to nonstandardized pay. Nonstandardized 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 nonstandardized pay cross-sectionally. Columns 2–5 include establishment-by-occupation fixed effects to show the within-panel association of increases in job growth and standardized pay, and progressively layer 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 nontrades occupations.

Source: The data source is the Wage Fixing Authority Survey.

nonstandardized 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 observation, 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.

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 head count by 20 percent in a given year, they were also 0.34 percentage points more likely to place workers onto nonstandardized

Table 4—Types of Pay Changes in Standardized Pay versus 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

Notes: 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 nonstandardized pay rates. Nonstandardized 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.

Source: The data source is from the Change Survey subsample of the Wage Fixing Authority Survey.

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.

VI. Differences in Standardized and Flexible Pay Setting

A. *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 versus flexible regimes. The WFAS includes a one-year follow-up Change Survey, in which establishments are recontacted 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 percent) or an inflation-indexed COLA-based change (12 percent) than flexible pay jobs (59 percent for general; 5 percent 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 percent versus 2 percent for standardized) or no pay increase at all in the last year (22 percent for flexible; 18 percent for standardized).

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.[8] They are more likely to skip pay increases and more likely to implement individual worker-specific pay changes.

B. *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.[9] 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."[10] 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 head count, an explicit item recorded in the WFAS (and distinct from the total number of employees in the targeted occupations). Establishment growth in the 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 nonstandardized 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 US manufacturing firms (Troske 1999). The premium is not significantly different for the workers under flexible pay.

[8] 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.

[9] 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, Steven. 1985. "Companies Turn to Incentives." *New York Times,* July 19. D4).

[10] Reuters. 1990. "Ford Deferring Merit Raises to Cut Costs." *Reuters News*.

Table 5—Differences in Size Premiums in Standardized Pay Jobs

	(1)	(2)	(3)	(4)	(5)
Nonstandardized Pay	−0.173	−0.039	−0.038	−0.027	−0.051
	(0.013)	(0.006)	(0.007)	(0.006)	(0.019)
Nonstandardized × log(Establishment size)	0.002	0.004	0.004	0.003	0.006
	(0.002)	(0.001)	(0.001)	(0.001)	(0.003)
log(Establishment 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 × City × Individual × Occupation				×	×
Occupation × Establishment		×	×	×	×
Year × Occupation × Firm					×
Observations	900,370	838,204	791,404	769,166	535,106

Notes: 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. Nonstandardized 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. Nonstandardized pay is interacted with total head count 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 coworkers, industry-city-level union density and state-level minimum wage. Column 1 shows the association between wages, establishment size, and nonstandardized 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 nontrades occupations.

Source: The data source is the Wage Fixing Authority Survey.

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 nonstandardized pay rates to the main effect suggests a 1.2 percent increase for nonstandardized 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 nonstandardized 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.

VII. Robustness Tests

A. *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 online 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. Online Appendix Table A.2 shows that excluding those observations yields estimates similar to the other weighting schemes.

B. *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, nonseniority 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, nonseniority reasons for pay variation or exclude combination systems from the definition of merit pay. Online Appendix Table A.3 shows that this coding decision has little impact on the wage effect estimates: flexible or nonstandardized pay effects are consistently negative across variable definitions.

VIII. 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 1999 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 percent or as much as one-fifth of the real wage decline for nontrades 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 nonunion 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, nonunion 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. 2019). The effects of standardized pay that we document are also micro-level evidence that institutions contributed to the deviation of noncollege 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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