This Draft: April 2022

Days of Work Over a Half Century: The Rise of the Four-day Week

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ABSTRACT

We examine patterns of work time in the U.S. from 1973-2018 with the novel focus on days worked per week, using intermittent CPS samples and one ATUS sample. Among full-time workers the incidence of four-day work nearly tripled during this period. The rise was not due to changes in demographics or industrial structure. The same growth is observed two other countries for which such data are available, the Netherlands and Germany. One rationalization for the growth of the four-day week is that consecutive leisure is superior, a conjecture supported by the observation that imputed wage rates are higher among four-day workers with such schedules than among others. At a point in time, four-day full-time work is more common among less educated, younger, and white non-Hispanic workers, among men, natives, and people with young children. It is more common among police and firefighters, health-care workers, and in eating/drinking places. We develop an equilibrium model of its prevalence and show using metropolitan-area averages that it results more from workers' preferences and/or daily fixed costs of working than from employers' production costs.

*Hamermesh: University of Texas at Austin, IZA and NBER; Biddle: Michigan State University. Andrew Lee provided very helpful research assistance. We thank George Borjas, Wolter Hassink, Peter Kuhn, Lester Lusher, David Weil, and participants in seminars at several universities for helpful comments; IPUMS University of Minnesota for the ATUS data; the Centre for Time Use Research for the Dutch time-use data, and Jagriti Tanwar for clarifying their characteristics; the Data Archiving and Network Service of the Netherlands for the OSA data; the Multinational Time Use Study for the 1985 U.S. data; Alexander Bick and Adam Blandin for the RPS data; and Florian Griese and Jürgen Schupp for information from the GSOEP. Joe Pinsker spurred our initial interest in this subject.

I. Introduction

The four-day workweek has been the focus of a huge growth in public interest in the past decade, with an especially large increase in attention since Covid lockdowns altered the nature of working time.[1] Recent anecdotes have described (usually favorably) how a few companies have introduced four-day weeks, and similar anecdotes can be found in the press have over the past 50 years.[2] Remarkably, however, the discussion of what might constitute a tremendous innovation in the organization of paid work has proceeded in a near total absence of even broad-based facts about days of work. Our aim here is to rectify this deficiency—to replace anecdotes with facts.

We know immense amounts about the determinants of the length of the workweek; hours per week or per year have been the staple of analyses of the determinants of labor supply. But weekly or annual hours consist of hours per day and the number of days worked (per week or per year). Other than some discussions of the history of days of work, particularly of legislation regulating numbers of days (Huberman and Minns, 2007; Costa, 2000), there has been no analysis of trends over the past 50 years. There has also been essentially no empirical discussion of the determinants of days per week, or even their correlates, with Mueller (2001) for Canada an apparently unique exception. On the surface this is surprising, since the original theoretical discussion of the fixed costs of working (Cogan, 1981) dealt in part with the daily costs of entering the workforce (although its empirical section dealt with weekly hours). The original departure from/neglect of this theoretical aspect has been repeated many times in subsequent research on labor supply (e.g., recently Beffy *et al.*, 2019; Gelber *et al*., 2021), with discussions of the daily fixed costs of working but with empirical analyses based on hours worked.

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[1]See, as a few recent examples, https://www.theatlantic.com/family/archive/2021/06/four-day-workweek/619222/; https://www.timecamp.com/blog/2021/10/the-pros-and-cons-of-a-4-day-work-week/ ; https://www.breathehr.com/en-gb/blog/topic/employee-performance/the-four-day-work-week-productive-or-pointless; https://www.theatlantic.com/family/archive/2021/06/four-day-workweek/619222/ ; https://www.theatlantic.com/ideas/archive/2022/02/work-from-home-revolution/622880/ .

[2]See *New York Times*, Nov. 22, 1970, p. 15.

The reason for the disjuncture between theory and empirics is simple: Weekly (annual) hours of work are ubiquitous in labor economists' arsenal of data, with large surveys of weekly hours being produced in many countries each month or quarter, and with annual hours included in many of the familiar national longitudinal household surveys. Information on days worked per week by large random samples of the labor force is much sparser, both over time and cross-sectionally. No large time series of cross-section data that allow charting time trends in four-day working or its determinants have been used, because such data are not well-known (but Hamermesh, 1998, did examine days of work in two years, 1973 and 1991). In what follows we bring together large cross-sections of such data for seven years between 1973 and 2018 for the U.S. to answer questions about the prevalence of the four-day week, how it has changed, its demographic and industrial determinants, and how widespread worldwide are changes in days of work.

Section II offers a brief theoretical underpinning for the empirical work, Section III describes the U.S. data that we use in most of the analyses, and Section IV employs those data to demonstrate the incidence and trends in the four-day workweek. Section V presents the main analyses of the determinants of this pattern of work in each of the seven years in our data, examines whether trends over the nearly half century of data can be described by changes in the variables that are their cross-section determinants, and looks at the especially interesting immigrant-native differences in the prevalence of four-day work schedules. Section VI uses data from the Netherlands and Germany, the only other industrialized economies for which trends in the pattern of workdays can be examined, to check on the possible uniqueness of trends in the U.S. Section VII delves more deeply into the determinants of these trends, while Section VIII attempts to rationalize cross-section differences in the four-day week.

II. A Conceptual Framework

Rosen's (1986) model of compensating differentials provides a framework for discussing the determinants of the prevalence of four-day work schedules in a labor market. Assume for simplicity that all jobs involve a fixed number of hours per week that can be worked on four-day schedule at wage w_4 or a five-day schedule at wage w_5. Let $w=W_4/W_5$, and let $F(w)$ describe the distribution of the values of w that will lead workers to prefer a four-day schedule. Any given worker's w will depend on his or her preferences for arranging leisure across the week, but also on differences in costs associated with a four- vs. a five-day workweek, such as child care costs. Likewise, there is a distribution G(w) across jobs in the value of w at which the employer offering the job would prefer to have it done on a four-day schedule, with the value of w associated with a job depending on the employer's cost function, that is, how the profit derived from the job is affected by having it on a four- vs. a five-day schedule. The market equilibrium w and the number of workers/jobs with a four-day schedule is determined jointly by F(w) and G(w). In Section VIII we expand this model to derive predictions about the sources of differences in the incidence of the four-day workweek.

The model implies sorting, that both workers and employers involved in four-day schedule arrangements will be those who derive the most value from them. It is difficult *a priori* to name personal characteristics that would naturally be associated with a preference for four-day work, but certain fixed costs associated with each day of work are obvious, including costs of child care and the cost of commuting. The possible business benefit to employers of four-day work schedules is a topic of discussion in relevant trade literatures. Businesses which find it advantageous to operate continuously (24 hours a day, seven days a week) face a complex scheduling problem, and management consultants sometimes recommend compressed schedules (four days, ten hours a day) to deal with that problem.[3] Implementing such a scheduling strategy has a fixed cost and requires multiple teams of employees working different four-day blocks, so that it is more likely to be feasible (and economical) in larger establishments.[4]

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[3]Although recent popular discussion of the four-day work week typically assumes a workweek involving four eight-hour days, such a four-day schedule is not much discussed in the trade literature for employers, and is much less common than some form of "compressed schedule." In the 2018 ATUS data, there are about three workers with four-day schedules involving 40 to 50 hours a week for every one worker with a four-day, 30-32 hour schedule; about the same ratio prevailed in 1985.

[4]For example, "The 4-3 Ten Hour Rotating Shift schedule uses 6 teams (crews) and 3 overlapping ten-hour shifts to provide 24/7 coverage. It consists of a 3-week cycle where each team works four consecutive 10-hour first shifts, followed by 3 days off duty, works four consecutive 10-hour third shifts, followed by 3 days off duty, works four consecutive 10-hour second shifts, followed by 3 days off duty." https://www.bmscentral.com/learn-employee-scheduling/4-3-ten-hour-rotating-shift/ . A standard estimate is that moving to a 24/7 operation requires the hiring of between four and six full-time employees for each position. (see, e.g., https://www.callcentrehelper.com/question-what-is-the-minimum-number-of-staff-required-for-a-24-hour-call-centre-2039.htm). Miller (2011) demonstrates that the number of employees needed to cover a single position in a 24/7 operation falls with the number of positions that must be covered.

Hospitals and similar health care facilities must operate 24/7, and discussions of best practices in scheduling nurses mention advantages of systems involving four-day schedules with 10 or 12 hours shifts, such as continuity of care (the patients and families interact with a smaller number of nurses during a hospital stay) and fewer "handoffs" of patients during which poor communication could lead to errors (Androus, 2021). Police and fire departments must also be staffed around the clock, and studies have shown that a four-day/ten-hour schedule reduces the costs of operating a police department, reducing overtime hours generated by the need for officers to do paperwork or make court appearances (Amendola *et al.*, 2011). Most such discussions of compressed schedules with four-day workweeks point to the possible costs in terms of lower worker productivity at the ends of long shifts; but it is also commonly noted that there are many workers who prefer compressed schedules to standard, five-day schedules, with occasional claims that the offer of a four-day compressed schedule can be a valuable recruiting tool.[5]

III. The U.S. Data

In May of selected years, the U.S. Bureau of Labor Statistics included a Work Schedules Supplement to the May Current Population Survey (CPS). These data are available for 1973, 1985, 1991, 1997, 2001, and 2004 (with 48,356; 25,858; 48,409; 45,375; 38,430; and 45,494 observations respectively). Along with the usual CPS demographics, among other questions the Supplement asked respondents to indicate how many days per week they usually work (on their main job). With the standard CPS question on hours usually worked, we can thus examine patterns of workdays among all workers and full-time workers.[6]

Regrettably the Supplement has not been fielded since 2004. In 2017 and 2018, however, for the only times in its twenty-year history, the American Time Use Survey (ATUS) asked respondents who stated

[5] See, e.g., https://www.bmscentral.com/learn-employee-scheduling/employee-scheduling-four-day-work-schedules-pros-cons/; Morrison (2020).

[6] The days question is: How many days of the week does xxx [usually] work at this job? The hours question is: How many hours does xxx usually work at this [the main] job?

that they worked for pay, 8,780 workers in the two years, specifically whether they worked on Sunday, Monday, …, and/or Saturday. (Hereafter for convenience we refer to the ATUS sample as being for 2018.) Since the ATUS is an extension of the CPS, it provides the same demographic and other information as is available in the May Supplements and information on hours usually worked on the main job (Hofferth *et al.*, 2018).

Although the annual ATUS samples of workers are much smaller than those in the earlier CPS Supplements, there are enough observations to allow comparisons that might demonstrate differences in hebdomadal patterns of paid work and their determinants. The responses are elicited similarly to those in the 1985-2004 CPS Supplements—asking about usual work on each day and asking workers for a single figure of days worked (on all jobs, not only the main job). In the 1973 Supplement only the number of days usually worked on the main job was asked, not which specific day(s) were usually worked.

While we examine days worked by all workers, our main focus is on "full-time" workers. For purposes of coverage under the Affordable Care Act, full-time work is defined as usually working 30+ hours per week (https://www.irs.gov/affordable-care-act/employers/identifying-full-time-employees). Yet economists have often included only those working 35 or more hours per week in some studies of labor markets (e.g., Juhn *et al.*, 1993) or as self-reported full-time work (e.g., Hoffmann *et al.*, 2020). Since its passage the Fair Labor Standards Act of 1938 has considered work of 40 or more hours per week as the threshold beyond which overtime penalty pay must be provided to non-exempt covered employees. In most of this study we define full-time work as 30+ hours per week, but we do check to be sure that the trends in weekly patterns of days of work are similar under other definitions of full-time.

With changes in industrial classifications over the nearly half-century, there is no consistent system for classifying industries at a very fine disaggregation. Instead, we have taken industrial classifications in each year and aggregated them into a set of 14 mutually exclusive and exhaustive industrial categories. Since one focus of the study is on the effect of changing technology on patterns of workdays, this allows us to examine this issue to the greatest extent possible given the available data and the length of the period that we study. A consistent classification could not be constructed for the 1973 data. For that reason, and because the ATUS data ask about days worked on all jobs, our main analyses of trends and their determinants looks at the 31-year period 1973-2004, covering the six CPS samples, the 33-year period covering 1985-2018, as well as the 45-year period, 1973-2018, covering all seven samples.

IV. Trends in Patterns of Days of Work

Figure 1a presents the time-series of the incidence of the four-day workweek in the U.S. under various definitions of full-time work. The most striking facts in this Figure are: 1) The upward trend in incidence; and 2) Not surprisingly, the greater frequency of four-day weeks when we define full-time as 30+ rather than as more weekly hours. The trends, however, are similar regardless of the definition of full-time work.

Restricting the sample to those workers who state that they put in exactly 40 hours per week, usually the result of an eight-hour five-day work schedule, we still observe in Figure 1b an upward trend in the incidence of the four-day workweek. Indeed, even if we look at all jobs, whether full-time or not, the incidence of the four-day workweek was rising over this nearly half-century.

The data for 2001 show a slight but statistically insignificant drop from 1997 in the incidence of the four-day week, the only drop between sample years. Increases in incidence, which occur between each other pair of years, are all statistically significant. We are concerned that the methods of collecting data on days worked in the ATUS differ from those used in the earlier CPS Supplements. Despite this difference, the averages for 2017-18 under most of the definitions of full-time work lie along the same trend line that is traced out by the earlier data.[7] The central and novel fact of this study is that the incidence of the four-day workweek has been rising more or less steadily in the U.S. over the past half-century. This increase among full-time workers is especially surprising in light of evidence (Kuhn and Lozano, 2008) that the share of full-time (30+ hours/week) working very long (50+ hours/week) grew over much of the time period covered by our sample.

[7]A linear trend shows an increase of 0.0010 per annum in the fraction of full-time employees (30+ hours per week) working four days per week, adjusted-R^2 = 0.939. The analogous regression defining full-time as 40+ hours per week shows an increase of 0.0005 per annum, adjusted-R^2 = 0.885.

As noted above, the CPS information for 1973 was collected slightly differently from that in later CPS Supplements, and the ATUS information referred to days worked on all jobs, not just the main job, as in the CPS Supplements. We can address the first issue by considering information from the 1977 Quality of Employment Survey (Quinn and Staines, 1979), which asked respondents about their usual work on each day of the week, just like the later CPS Supplements. Among full-time employees (both respondents and their spouses) in the QES (N = 1,456), a fraction 0.0213 (s.e. = 0.0038) worked four days per week. In 1973 the incidence of four-day weeks in the CPS Supplements was 0.0191, in 1985 0.0349. Arbitrarily assuming a linear trend between 1973 and 1985 implies that a survey like the later CPS Supplements would have shown an incidence of 0.0243 in 1977. This average is within one standard error of the QES average, giving some assurance that the different methods of collecting the data in 1973 and later are not responsible for the observed trends.

On the second concern, excluding multiple job-holders from the estimates for 2018 reduces the estimated fraction of full-time four-day workers only very slightly, from 0.0655 to 0.0644. Concerns about differences in the framing of questions that elicited the information underlying the estimated trends are misplaced. It is also worth noting that a CPS-like survey (Beck and Blandin, 2021) showed that the fraction of full-time workers with four-day weeks in February 2020 was significantly even **higher** than that calculated from the ATUS for 2017-18. Both comparisons suggest that our estimate for 2018 is not an overstatement.

Our focus is on four-day workweeks, but a reasonable question is whether other weekly work schedules exhibit trends that are worth examining. Figure 2 charts other patterns of workdays across the seven samples in our data set. The very low incidence of three-day workweeks among full-time workers, or six- or seven-day workweeks among part-time workers, did not change over the half-century. There has been a slight decline in the incidence of three-day workweeks among part-time (fewer than 30 hours/week) workers, and a decline in the incidence of work on more than five days/week among full-time (30+ hours per week). This decline, however, occurred essentially entirely between the 1973 and 1985 samples, differing from the nearly steady rise in the four-day week shown in Figure 1.

Figures 3 depicts the raw incidence of four-day workweeks by industry among full-time workers from 1985, the first year in our sample when the industry classifications could be constructed on a comparable basis, through 2018. Except for primary industries and construction, the aggregate trend shown in Figure 1 is reproduced in all industries. These Figures illustrate that the aggregate rise in this pattern of work is general and not merely due to large increases concentrated in a few industries. There are substantial differences across industries in the incidence of the four-day workweek, with it being particularly prevalent among police and fire-fighters, in eating and drinking places, and among health-care workers.

Figures 4 illustrate trends in the four-day workweek since 1973 by method of pay (hourly or not), gender, race, and immigrant status. In all four figures the incidence of four-day weeks is rising for both groups—the increase in the four-day workweek is widespread across demographic groups. The incidence is, however, rising much more rapidly among hourly-paid than salaried workers, and more rapidly among men than among women. The upward trends are essentially the same among African Americans and workers of other races and non-black Hispanics. The comparison between immigrants and natives begins only in 1997, when the data on nativity were first available in the CPS Supplements. There is little change in either series between 1997 and 2004; but between 2004 and 2017-18 the increase in incidence was more pronounced among immigrants than natives.

The trends in the four-day full-time workweek imply an increase of 0.041 percentage points among employees working 30+ hours, and 0.028 percentage points among those with 40+ hours weeks. Although these increases imply tripling (in the case of 30+ hour workers) and nearly quintupling (in the case of 40+ hour workers), even in 2017-18 they represented small fractions of total employment. In terms of numbers, however, they seem large: 3.05 million additional workers among those with 30+ hours, 2.06 million among those with 40+ hours (and thus implicitly 0.99 million additional employees with 30-39 weekly hours). As an indicator of their importance, in either relative or absolute terms, these increases almost surely reflect the behavior of many more people than the growth in the much bruited-about gig economy.[8]

[8]See Oyer (2020) for a discussion of the size and growth of gig work, and Abraham *et al*. (2019) for indications of cross-sectional differences in its incidence in the U.S. economy.

V. Verification for the Northern Europe

The evidence of the growing incidence of four-day workweeks in the U.S. is striking. But is this a localized phenomenon, or might it be broadly characteristic of the industrialized world? This is an especially interesting question in the light of the absence of much decline in the length of the workweek in the U.S. in the last half-century, and a similar absence in much of Western Europe in the past quarter-century.[9] The absence of any time-series on days of work in most countries prevents generalizing the U.S. results to many other countries. We can, however, examine the same question, although not in the same detail, for the Netherlands. The Dutch *Tijdbestedingsonderzoek (tbo)*, a quinquennial time-use survey, asks respondents to keep time diaries for seven consecutive days. It is the only national survey to do this. We can thus look at samples from this survey and examine among full-time workers (defined as 32+ weekly hours, the Dutch definition of full-time work) on how many days per week they perform paid work.

The calculations in this section are not strictly comparable to those from either the CPS May Supplements nor the ATUS. The *tbo* collects diaries on each day of the survey week, Sunday through Saturday, allowing us to calculate weekly hours as the total reported over the seven days, and to calculate days worked as the number on which positive workhours were listed in the respondent's diaries. Thus, hours and days worked are for the week for which diaries are kept rather than referring to usual work time, as in the American surveys. Also, unlike in the U. S. data, in which workers responded to specific questions about each day of the week so that the data reflect at least a seven-day recall, in these data there are explicit diaries collected for each day on the following morning. Arguably these data reflect the underlying phenomenon even better than the ATUS data, assuming that the diary weeks were typical of the respondents' work time.

[9]In the U.S. between 1973 and 2019 average hours worked per worker did fall, but from 1,860 per year to 1,777 per year. During this same period hours in the Netherlands fell much further, from 1,749 per year to 1,440. Most of this drop occurred by 1985, however; since then, annual hours have fluctuated between 1,496 and 1,411. https://data.oecd.org/emp/hours-worked.htm .

Table 4 presents the distributions of weekly days of work among full-time Dutch workers for each of the seven sampled years, 1975-2005. It is worth noting that, while average hours worked per year in the Netherlands fell over much of this period, among workers defined as full-time (32+ hours) average weekly workhours changed very little, fluctuating between 42.07 and 43.10. Despite the absence of any large change in the length of the full-time workweek, the percentage of workers performing paid work on only four days in the survey week more than quintupled, rising from 2.6 percent in 1975 to 13.5 percent in 2005, the last year for which the data are readily accessible. By far the largest rise was between 1980 and 1985.[10] The increase was monotonic, and the rise in these samples was statistically significant between most years. The results suggest that the phenomenon that we have documented for the U.S. is not unique in the industrialized world.

A similar phenomenon is evident in German data from the German Socioeconomic Panel for 1995 through 2018. In many years, beginning in 1995, panel members indicated on how many days they usually work, essentially the same question as in the 1973 CPS Supplement. For 1995 and 1997 the responses gave an average fraction of 0.0283 (s.e. = 0.0015); for 2016 and 2018 they averaged 0.0618 (s.e. = 0.0014). While the increase over this near quarter-century was more rapid than in the U.S. over the same period, the final fraction is almost identical to that in the U.S. in 2017-18.

VI. The Determinants of the Four-day Workweek and Its Rising Incidence

In this section we examine the measurable supply- and demand-side correlates of the four-day week and consider how changes in them over time might be related to the observed increase in its incidence. We use the usual CPS demographic information: Marital status; educational attainment (less than high school; high school; some years of college; and college completion or more); a quadratic in potential work experience (age – years of schooling – 6); race/ethnicity (white non-Hispanic, African American, non-black Hispanic, other race); gender; and number of children under age 5. For years 1997 and after we also use an indicator for the worker being an immigrant. For all the samples except 1973 we capture possible changes

[10]This may have been part of the fall-out from the Wassenaar Agreement of 1982, which altered definitions of part-time work over the week and may have spilled over onto the determination of days of work.

in technology by creating indicators for the large industries for which the time path of the incidence of the four-day week was shown in Figures 3, and we also include an indicator of union coverage beginning with the 1985 data.

A. Pooled and Cross-section Estimates

Since Figure 1 showed that the incidence of the four-day workweek among full-time workers varies with the definition of full-time, it is essential to adjust for differences in weekly hours among full-time workers, however defined. To do so we add the worker's usual weekly hours of work to the linear probability estimates of the determinants of the four-day workweek. Moreover, in light of the evidence in Biddle and Zarkin (1989), we specify weekly workhours as a quadratic.[11] Finally, we include year fixed effects when we pool the samples.[12]

Table 1 presents estimates of the model pooled over all seven samples and then estimated for each year separately. CPS and ATUS sampling weights are used throughout.[13] The parameter estimates of the year indicators are not shown, but they parallel the general increase in the average incidence of the four-day workweek shown in Figure 1. Similarly, the parameter estimates on the industry fixed effects parallel the differences in levels shown in Figures 3.[14]

To the extent that these reduced-form estimates are informative about people's preferences, these cross-section demographic determinants of the incidence of the four-day workweek are in some cases surprising. They show that greater human capital investment—additional formal education, and also additional potential labor-force experience—is associated with a lesser likelihood of having a four-day

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[11]None of the results reported below changes if we instead include fixed effects for each weekly hour of work beyond 30 hours.

[12]12 percent of full-time workers in the samples had one child under age 5, and 3 percent had two or more very young children.

[13]The weights in the pooled estimates are themselves re-weighted to make the average weight the same in each year, so that each year effectively contributes the same number of observations to the estimation over the pooled sample.

[14]The impact of additional weekly hours beyond 30 decreases up through 60 weekly hours, the 98th percentile among full-time workers, turning positive only with additional hours beyond 60. Average weekly hours among these full-time workers ranged across the seven samples between 41.57 and 42.65.

workweek, conditional on the number of hours worked in the week. Young workers—those with fewer than five years in the labor force—are more likely than more senior workers to be on a four-day workweek, with little difference as potential experience rises beyond four years. Also, the incidence of a four-day week decreases steadily with additional education.[15]

Being a minority—African American, non-black Hispanic, or some other non-white race—is also associated with a significantly lower incidence of the four-day workweek. Women are less likely than otherwise identical men to be working a four-day week, while married individuals are very slightly more likely than otherwise identical singles to be doing so. The one strong result that is consistent with expectations—that the fixed costs of childcare will lead people to concentrate their workhours on fewer days of the week—is that the presence of a child at home under age five is associated with a substantially greater likelihood of working only four days per week. The estimates vary across the years for which the data are available, but on average they suggest that having a young child in the household is associated with about a ten-percent increase in the likelihood of working a four-day week. The estimates also imply that otherwise identical immigrants with the same experience, education, race/ethnicity, and in the same industry are significantly less likely than natives to be on a four-day week. The differences by nativity are large—implying a greater than 25-percent lower likelihood of four days of full-time work among immigrants.

B. Decomposing Possible Causes of the Increased Incidence of the Four-day Week

There were substantial changes in both the demographic and industrial structures of the U.S. economy over this half-century. As just a few examples: 1) Women increased from 36 to 45 percent of the full-time labor force; 2) White non-Hispanics fell from 84 to 64 percent of full-time workers; 3) Health-service workers rose from 7 to 10 percent of full-time workers between 1985 and 2018, while other service workers increased from 12 to 22 percent; 4) Manufacturing accounted for 25 percent of the full-time workforce in 1985, but only 14 percent in 2018.

[15]None of these inferences changes if we use the appropriate probit specifications to generate the parameter estimates.

Do these and other changes in the set of X variables that Table 1 showed affect the incidence of the four-day week "explain" the near-tripling of the incidence? Because the equations in each year are not comparable, and because we need the same specifications in each pair of years that we compare, we can write the decompositions generally as comparing Y_b, the incidence in some base year, to:

(1a) $Y^*_e = \beta^*_e \cdot X_b$,

and comparing Y_e, the incidence in the end year, to:

(1b) $Y^*_b = \beta^*_b \cdot X_e$,

where the β^* are the estimated parameters in the base-year and end-year equations, and the X_b and X_e are the average values of the independent variables in those years. By generalizing the standard decomposition to different base and end years, we can vitiate problems of the changing availability of information on some of the X variables and the slight differences in the questionnaires across the samples.

The first row of Table 2 lists the actual base- and end-year average incidence of four-day workweeks, and the calculations implied by (1a) and (1b), for 1973 and 2018. The calculations are based on the parameters shown in Column (2) of Table 1 and an equation specified exactly the same for 2018. The results make it clear that changes in the demographic variables over the nearly half-century account for none of the rise in the four-day workweek. It was due entirely to changes in the estimated parameters, in particular, to the increase in the constant term necessary to describe the rising incidence. The second row in the Table presents the same calculations, but with 1985 as the base year and using the estimates in Column (3) of Table 1 and an equation for 2018 specified the same way. The implications are the same as those from the first row: Changing demographics account for none of the rising incidence; changing industrial structure also account for none.

The final three rows of Table 2 present decompositions for different base and end years. The third is based on the specifications in Columns (5) and (8) of Table 1 that include both industry indicators and an indicator of nativity. Comparing it to the second row of Table 3, again the implication is that changing characteristics, including the substantial changes in industry composition, are not generating the rising incidence. The final two rows account for concerns about the possible non-comparability of the ATUS data to the data for the earlier years. Despite this possible difficulty, the inferences are the same as those from the first two rows of the Table: The rise in incidence is not at all explained by changing demographics or industry composition.

C. Further Results on Nativity

The impact of nativity on the incidence of the four-day workweek is interesting and allows inquiring whether the aging of the immigrant workforce might explain the more rapid upward trend among immigrants than natives shown in Figure 4. This seems especially sensible, since in 2018 the population of immigrant workers was older than in 1997 (41.3 vs. 38.7), and the share of those who had immigrated as children was greater. In particular, perhaps the differential trend is explained by increasing assimilation among immigrants, since we know that changes in both earnings (Borjas, 1985) and time use (Hamermesh and Trejo, 2013) reflect the assimilation of immigrants to native outcomes. To examine this possibility, we pool the data for 1997-2018 and re-estimate the basic equations shown in Columns (5)-(8) of Table 1, adding year indicators.

Column (1) of Table 3 presents the means of the fraction of the work force over this twenty-year period who are immigrants and of the fractions of immigrants by two characteristics: 1) Whether the immigrant arrived in the U.S. before age 15 (and thus probably spent at least two years in American schools); and 2) Whether the immigrant came from a country in which English was an official language (including India and Hong Kong). About 30 percent of immigrants arrived while young, and 20 percent came from an English-speaking country.

The second columns of the table show the estimated impact of nativity status on the incidence of the four-day workweek, accounting for all the controls shown in Table 1 (and the year indicators). The results parallel those in Table 1. Estimates presented in the final column add the indicators of age at immigration and birthplace. The estimates of the impacts of both are positive, and the t-statistics are 1.50 and 1.44 respectively. There is some, albeit not strong evidence that in terms of the pattern of workdays, immigrants who arrived as children, and those whose knowledge of English is likely to be greater, behave more like natives than do other immigrants.

VII. Other Possible Explanations of the Growth of the Four-day Workweek

A. Establishment Size, Commuting Time, and Split Shifts

As discussed in Section II, adoption of a four-day compressed schedule in conjunction with longer hours of operation is more feasible and more economical for larger establishments. It is possible, then, that the changing size of American establishments has eased employers' ability to schedule workers' employment on four days.

Henly and Sánchez (2009) show that there was little change in the average number of employees per establishment between 1970 and 2006, thus covering all but the final sample that we use. The absence of change, however, masks sharp sectoral differences: The average size of manufacturing establishments fell, while that of service establishments increased. These differences would lead us to expect that, if changes in establishment size were driving the trend:

(2) $\Delta^2 = \{[I_e]_S - [I_b]_S\} - \{[I_e]_M - [I_b]_M\} > 0$,

where I is the incidence of full-time four-day work, and the subscripts S and M denote services and manufacturing respectively.

To examine this double-difference, we take I for each sector in 1985 and 2018. In these samples Δ^2 = -0.0175 (s.e.= 0.0039), implying that the incidence of four-day work among full-time service workers rose significantly **less** rapidly than did that of full-time manufacturing workers. Given the absence of a direct link to establishment size in these CPS and ATUS data, all we can conclude from this calculation is that we fail to find evidence in support of this explanation.

Since a longer commute time represents higher fixed daily costs of work, a general increase in commute times might be an explanation for the increase in four-day work schedules.[16] The CPS data do not include information on commute time, but we imputed commute times for each worker in our samples

[16]In the very sparse literature on days, one study (Gutiérrez-i-Puigarnau and van Ommeren, 2010) did consider commuting time and (retrospectively reported) days of work per week, basing the discussion on fixed daily costs of working.

based on Census commuting data and the worker's location.[17] Our imputed measure of average commute time indicates that the length of the average one-way commute increased by five minutes between 1985 and 2018, from about 20 minutes to 25 minutes per day (very close to commute times shown in the small 1985 time-use survey, 26 minutes, and in the ATUS in 2017-18, 25 minutes). Adding imputed commute time variables (average commute time and/or percentage of area workers commuting more than an hour per day) to the regressions, however, provides no evidence of a cross-section relationship between commute times and the prevalence of four-day work schedules. If anything, four-day work schedules are less common in areas with longer commute times.

A compressed four-day schedule is an approach to scheduling workers in facilities operating around the clock. An increase in the number of establishments operating outside the traditional business hours, due to globalization or other economic trends, could be a reason for the rise of four-day schedules. Two variables in the CPS data might indicate the presence of a rise in establishments with longer hours of operation. From the CPS Supplements 1985 - 2004, we construct a consistent measure of whether the worker was regularly scheduled to work between 10 PM and 6 AM. The incidence of such "night work" in our sample increased from 12.3 percent in 1985 to 14.6 percent in 2004. Also, throughout this period, those who reported night work were about 50 percent more likely to be working four-day schedules than those who did not – a difference that remained fairly steady over the period. Taken together, however, these two facts can only account for a tiny fraction of the 0.0464 increase in four-day work schedules, only 0.0007—less than two percent of the increase.[18].

[17]An "area," which could be the non-metro counties of a state, a specific metro area, or the central city or suburb of a specific metro area, was identified for each worker. The worker's predicted commute-time variables were then based on the average commute time in his or her area in the most recent past Census of Population and on a measure of employment growth in the area since then. Details of the imputation procedure are available on request.

[18]There was an increase of 0.023 in the proportion of nighttime workers, and the difference between day and night workers in the probability of having a four-day schedule averaged 0.030. Multiplying these yields the tiny difference reported in the text.

Another possible indicator of an increase in extended hours or round-the-clock-operation would be an increase in the number of workers reporting split shifts, rotating shifts or other irregular work shifts. We have consistent measures of this from 1985 to 2018. Workers reporting these odd shift patterns are twice as likely as other workers to have four-day schedules. The proportion of workers reporting these unusual shifts, however, fell, from 0.100 in 1985 to 0.053 in 2004 and 0.043 in 2018.

B. Desires for Bunching Leisure

Another possible explanation is that four-day work (three days of leisure) increased in prevalence because real incomes rose, and it is income-superior to bunch leisure. Under what circumstances might individuals prefer bunching? Consider a single-person household deciding how to allocate time across the seven days of the week to maximize:

(3) $U = U(L_1, \ldots, L_7; C), U_i > 0, U_{ii} < 0,$

the standard formulation except for the specification of leisure, L, on each of seven days. Abstract from the length of the workweek by assuming that ΣL_i is fixed. The individual's only choice is how to allocate the fixed weekly leisure time across days. Absent any constraints, and assuming $U_{CLi} > 0$ is the same on all days, the optimal choice with no interdependence across days (i.e., assuming $U_{ij} = 0 \ \forall \ i \neq j$) is to consume the same amount of leisure on each day. Bunching leisure on weekends (Days 6 and 7) must occur because U_{67} is sufficiently positive to overcome the disincentive to bunch leisure that exists because each $U_{ii} < 0$. Whether this arises from individual preferences, perhaps due to desires to avoid day-to-day spillovers of stress from the workplace, perhaps because of pure complementarities in the enjoyment of leisure, or because of constraints imposed on workers by laws or custom is irrelevant: Obviously, this bunching has occurred in most societies.

Three days of leisure would be consecutive—a three-day weekend—if U_{56} or U_{71} were sufficiently positive to overcome the negativity of the U_{ii}, since it reduces leisure still further on the other four days of the week, or if production costs favored this kind of bunching. We cannot distinguish between preference and cost explanations for bunching. If, however, preferences are important and are described by $U_{56} > 0$ and/or $U_{71} > 0$, and assuming as always that preferences are independent of incomes, we should expect that individuals with higher full earnings, if they can work a four-day week, would be more likely than others to do so on four consecutive days. A bit of evidence that the three-day weekend is income-superior among those choosing a four-day week is provided by the fact that, only after income had risen rapidly, did the U.S. enact a law that converted public holidays which had previously occurred on various days of the week to Monday-holidays.[19]

Stronger evidence for the role of leisure-bunching as a superior activity is provided by comparing earnings between those four-day workers who enjoy three consecutive days of leisure and those who do not. Among full-time workers with four-day weeks in the 2018 ATUS, 88 percent bunched leisure into three days, as Table 5 shows. To avoid endogeneity, we estimate the determinants of earnings using the sample of full-time workers in 2004 separately for men and women, including all the variables included in Table 1, and then use these estimates to impute earnings in the sample of four-day workers from 2018. Imputed weekly earnings among four-day full-time workers who bunched leisure were 14 log-points higher than those of other full-time four-day workers. The upper-right of the Table shows the estimated regression coefficient of the probability of bunched leisure on imputed log earnings. It suggests that a 10-percent increase in earnings raises the probability of leisure-bunching by 1.6 percentage points, small but statistically significant.

The Dutch *tbo* did not collect information on wages/earnings. We can, however, use the "Labor Supply Panel" of the Organization for Strategic Labor Market Research (OSA) to match exactly to the demographic variables available in the *tbo* to impute earnings. To do that, we again estimate separate equations describing the monthly earnings of men and women, pooling the OSA data on workers ages 22-64 for most years from 1985 (the first available year) through 2006.[20] The estimates for both genders include

[19]The Uniform Monday Holiday Act of 1968, created additional three-day weekends by moving some holidays to (usually) the nearest Monday. These included Presidents' Day (previously Lincoln's and Washington's birthdays), Memorial Day, and Columbus Day. Martin Luther King Day was added as a Monday holiday in 1983, as was Juneteenth in 2021. Each commemorates an event that occurred on a particular date, usually not on Monday.

[20]Ter Weel (2003) uses these data to estimate wage equations over random samples of Dutch workers in 1986, 1988, …, 1998, based on years of schooling, a quadratic in age, citizenship status (not available in the *tbo*), and gender.

as independent variables indicators of age, educational attainment, marital status, and ages of youngest children. Also included are indicators of the year of the survey and a quadratic in the person's weekly hours of work.

The bottom panel of Table 5 presents results for the Netherlands that are analogous to those in the upper panel for the U.S. 60 percent of full-time four-day Dutch workers over the period 1975-2005 bunched leisure into three consecutive days. The estimates imply that a ten-percent increase in earnings in the sample raised the probability that the four days of work were associated with three consecutive days of leisure by 2.6 percentage points.[21] These results are qualitatively and quantitatively similar to the U.S. estimates**.**

VIII. Rationalizing Cross-section Determinants of Days of Work

The prevalence of jobs with four-day workweeks will be a function of the both the distribution of preferences and fixed costs of daily work across workers (supply-side factors), and the distribution of cost functions across employers (demand-side factors). Here we motivate an empirical approach to determining whether cross-section differences across markets in the prevalence of four-day workweeks are due mainly to differences on the supply side or on the demand side. In an evaluation framework we would simply consider how some exogenous shock altered behavior on one side of the market and examine the before-after difference in four-day weeks and/or the wage premium for such work. No such shock is available; instead, we use our model to infer the nature of the possible shocks that could generate the observed equilibria.

Assume that jobs requiring a fixed number of hours per week can have four-day or five-day schedules. Let the wage for a five-day job be 1, and the wage for a four-day job be w. Assume two types of workers, with Type 1 workers preferring four-day schedules more than Type 2 workers for reasons of preferences or the daily fixed costs of work. Both types have reservation wages for a four-day workweek, with distributions described by CDFs $F_1(w)$ and $F_2(w)$, with pdfs $f_1(w)$ and $f_2(w)$. That is, $F_j(w)$ is the probability that a Type j worker's reservation wage for a four-day workweek is less than w, with $F_1(w) >$

[21]In both the U.S. and Dutch data, probit estimates of the equations describing the probability of leisure-bunching among four-day workers yield identical implications to those from the least-squares regressions presented in Table 5.

$F_2(w)$ at any wage that might be observed in the labor market. In the neighborhood of equilibrium, we assume that the Type 1 supply curve to four-day jobs is no more elastic than the Type 2 supply curve. Letting α be the share of Type 1 workers in the population, the supply of workers to four-day jobs as a proportion of all workers at a wage premium/penalty of w is:

$$\alpha F_1(w) + (1-\alpha)F_2(w) .$$

On the demand side, there are two types of employers, each offering one job, with reservation wages for offering that job with a four-day workweek distributed according to CDFs $G_1(w)$ and $G_2(w)$, with pdfs. $g_1(w)$ and $g_2(w)$. At wage w for four-day jobs, the probability that the job offered by a Type j employer will have a four-day workweek is $(1 - G_j(w))$, $G_2(w) > G_1(w)$, and we assume that in the neighborhood of equilibrium, the demand elasticity of Type 1 employers is less than or equal to the demand elasticity of Type 2 employers. Letting β be the share of Type 1 employers in the economy, the demand function for workers in four-day jobs (as a proportion of the work force) is;

$$\beta(1-G_1(w)) + (1-\beta)(1-G_2(w)) .$$

The equilibrium wage for four-day jobs is the wage for which:

$$\text{(4)}\quad \alpha F_1(w) + (1-\alpha)F_2(w) = \beta(1-G_1(w)) + (1-\beta)(1-G_2(w)) .$$

The share of all four-day workweeks that is provided by Type 1 firms is:

$$\text{(5)}\quad [\beta(1-G_1(w)]/ [\beta(1-G_1(w)) + (1-\beta)(1-G_2(w))],$$

and the share of four-day workweeks among Type 1 workers is:

$$\text{(6)}\quad [\alpha F_1(w)]/[\alpha F_1(w) + (1-\alpha)F_2(w)].$$

A higher value of α in a market implies a supply curve to four-day jobs that is further to the right, i.e., a higher supply of workers to four-day jobs at any given wage. Total differentiation of (4) shows that greater α will cause the wage (relative to the wage on five-day jobs) to fall, since:

$$\text{(7)}\quad dw/d\alpha = -[F_1 - F_2]/[\alpha f_1 + (1-\alpha)f_2 + \beta g_1 + (1- \beta)g_2] < 0$$

It will increase the share of four-day jobs held by Type 1 workers, but will **decrease** the share of four-day jobs with Type 1 employers. (The sign of the derivative of (5) with respect to α is the sign of $\beta(1- \beta)[g_2$ (1-

$G_1) - g_1(1\text{-}G_2)][dw/d\beta]$, which is negative given our assumption about the relative demand elasticities of Type 1 and Type 2 employers.) This happens because the decrease in the wage leads more Type 2 employers to offer four-day workweeks, diluting the dominance of the Type 1 employers among firms offering four-day jobs. Similarly, $dw/d\beta > 0$, so that if a market has a greater share of Type 1 employers, the total share of Type 1 workers in four-day jobs is lower.

Suppose now that we observe a cross section of labor markets with differing proportions of workers with four-day workweeks. The model suggests that if these differing proportions are due mainly to differences in supply-side factors, the proportion of four-day workweeks will be more positively correlated with worker characteristics associated with a preference for four-day workweeks than with employer characteristics associated with higher demand for four-day workweeks. It also implies that the share of four-day workers employed in the types of firms known to have a cost advantage in offering four-day workweeks will be lower in markets with higher proportions of four-day workweeks. On the other hand, if differing proportions of four-day workweeks are due mainly to differences in demand-side factors, the proportion of four-day workweeks will be more positively correlated with employer characteristics associated with a higher demand for four-day workweeks than with worker characteristics associated with a preference for four-day workweeks, while the share of four-day workers with characteristics related to a preference for a four-day workweek will be lower in markets with higher proportions of four-day workweeks.

To consider evidence on these patterns, we assume that MSAs represent separate labor markets and pool the CPS cross sections for 1997, 2001, and 2004, under the assumption that in this seven- year period differences across metropolitan areas in the supply and demand curves for four-day work were stable, so that the outcomes describe an equilibrium. We limit the sub-sample here to the 67 metropolitan areas with 350 or more full-time workers. This restriction generates substantial heterogeneity across areas along with some precision in the estimates of I by area: The proportion of four-day schedules ranges from 0.018 to 0.090, with a mean of 0.047 and a standard deviation of 0.015.[22]

We use this sub-sample to estimate individual-level regressions like those reported in Table 1 to identify possible observable proxies for the worker and employer types in the model. There is no worker characteristic with a strong and significant correlation with four-day schedules that can also be clearly identified as being related to preferences and not productivity. As in the Table 1, however, certain of our industry categories have significant and non-trivial coefficients in the regression. The four industries with relatively high proportions of four-day schedules (high-four industries) are police and fire protection; health services; food service; and road, rail, and air transportation. In Section II we discussed reasons that employers in the first two industries make use of the four-day workweek, and food service establishments sometimes adopt four-day scheduling schemes to enable operation during extended hours, six or seven days a week. In the transportation industry, compressed schedules are used to accommodate safety regulations specifying maximum consecutive hours of work for drivers, pilots, and crews. The industries in which relatively few four-day workweeks are observed (low-four industries) are finance, insurance and real estate; wholesale trade; construction; and education. We classify employers in high four-day industries as Type 1 employers, and those in low four-day industries as Type 2 employers.

Define the variables *highfour* and *lowfour* as the shares of an area's workers in each type of industry. Variables measuring the proportions of a metropolitan area's four-day jobs that were in high-four or low-four industries were also created. Across the 67 metro areas, *highfour* ranges from 0.10 to 0.25, *lowfour* from 0.19 to 0.40. Figure 5 shows a scatter of the proportion of four-day schedules in a metro area by the share of metro area employment in high-four industries, along with the fitted regression line. There is no evidence that these differences in industry structure are the cause of differences across metro areas in the prevalence of four-day schedules. The relationship is actually negative and statistically significant. In a

[22]Since for even the least-populated cell in this sample the proportions are fairly precisely estimated (with 350 observations, the standard error at the mean is about 0.01), the signals in these sample averages are sufficiently precisely estimated to allow us to use them as the basis for the cross-labor market analysis.

regression describing the fraction of four-day employment in an area that includes both *highfour* and *lowfour* as regressors, the coefficient of *highfour* remains negative and statistically significant, while the estimated impact of *lowfour* is negative (t = -0.85.)[23]

The model implies that if supply-side factors explain differences across metro areas in the prevalence of four-day schedules, the share of jobs in the high-four industries will be lower in areas with a higher prevalence of such schedules, and the share four-day jobs in low-four industries higher. Figures 6a and 6b show this to be the case. Figure 6a presents a scatter and regression of the share of an MSA's four-day jobs that are in high-four industries on the share of four-day jobs among all jobs in the MSA. The relationship is negative and statistically significant. In Figure 6b, the share of an MSA's four-day jobs that are in low-four industries is on the Y axis, and the relationship between this and the overall proportion of four-day jobs in the MSA is positive and significant.

The patterns shown in Figures 6 are consistent with the hypothesis that differences across U.S. labor markets in the prevalence of four-day workweeks are largely due to differences across markets in the distributions of preferences and costs on the supply side of the labor market. Other explanations of the patterns are possible, but the evidence at least suggests that more careful investigations of potential supply-side determinants of the number of jobs with four- versus five-day workweeks would be fruitful.[24]

IX. Conclusions and Implications

The product of days worked per week and hours worked per day—weekly workhours—has formed the focus of the majority of the massive literature describing and analyzing labor supply. Analysis of the individual elements of this product is essentially non-existent. We have tried to remedy this deficiency

[23]The regressions are weighted by number of underlying observations in the metro area over the three sample years.

[24]The evidence also weighs against the hypothesis that cross-section differences in the proportion of four-day weeks are due to greater demand by employers who prefer a four-day workweek for some reason other than industry. If one added to the model a Type 3 employer who preferred four-day workweeks as much or more than Type 1 employers, a higher number of such employers in a labor market would lead to lower shares of both Type1 and Type 2 employers among jobs with four-day workweek. That is inconsistent with our finding that metropolitan areas with a higher proportion of four-day weeks also have a higher proportion of low-four employers among employers offering four-day weeks.

using a set of data from large U.S. surveys, the only such available, covering selected years 1973 through 2018. The results show a tripling of the incidence of full-time work occurring on only four days/week (a quintupling under a more stringent definition of full-time). This increase is not small, amounting to about four percent of full-time employment in the U. S. A similar increase exists in another economy, the Netherlands, for which the relevant data are available.

The rise in four-day full-time work is totally inexplicable by changes in the demographics of the work force or by changes in industrial structure. Nor is it due to changes in the size of establishments, in the incidence of split shifts, or to increases in commuting time. We show that the desire for bunched leisure—the three-day weekend—is income-superior, so that the increase in four-day work may be a reflection of continuing growth in real incomes. Moreover, our development and testing of an equilibrium model suggest that supply-side (worker) differences generate the phenomenon, not demand-side (employer) differences.

While the four-day week is of immense popular interest, the growth in its importance does not appear to have been noticed previously. The fact that we have uncovered—and the apparent absence of its relationship to changing technology or demographics—would seem ripe for much additional analysis. Aside from providing answers for policy for those who might wish to change incentives for the number of workdays per week, such analysis could go further than has been possible here to delve more deeply into the underlying causes of this phenomenon and its growth. Such analysis might even be able to link the four-day week more directly to supply-side costs, which our work indirectly suggests are important, in a way that allows a serious structurally-based discussion of the importance of the role that daily fixed costs of work play in the supply of labor.

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Table 1. Linear Probability Estimates of the Incidence of a Four-day Workweek, Works with 30+ Weekly Hours, U.S., 1973-2018[a]

	Pooled[b]	**1973**	**1985[c]**	**1991**	**1997**	**2001**	**2004**	**2017-18**
High school	-0.00701	0.01000	-0.01386	-0.00796	-0.00462	0.00974	-0.00575	-0.02333
	(0.00135)	(0.00169)	(0.00373)	(0.00340)	(0.00391)	(0.00438)	(0.00417)	(0.01251)
Some college	-0.00094	-0.00891	-0.01273	-0.00797	-0.00319	0.01817	0.00403	-0.02063
	(0.00148)	(0.00225)	(0.00435)	(0.03788)	(0.00405)	(0.00450)	(0.00428)	(0.01307)
College+	-0.01631	-0.01425	-0.01683	-0.01539	-0.00620	0.00511	-0.00333	-0.04991
	(0.00149)	(0.00220)	(0.00446)	(0.00389)	(0.00425)	(0.00466)	(0.00441)	(0.01272)
EXP5-14	-0.00709	0.00019	-0.00848	-0.01477	-0.01954	-0.01236	-0.00067	-0.01768
	(0.00151)	(0.00218)	(0.00404)	(0.03661)	(0.00408)	(0.00451)	(0.00433)	(0.01059)
EXP15-24	-0.00737	-0.00110	-0.00565	-0.01315	-0.01667	0.00356	-0.00439	-0.00167
	(0.00154)	(0.00234)	(0.00434)	(0.00375)	(0.00407)	(0.00447)	(0.00433)	(0.01106)
EXP25+	-0.01214	-0.00749	-0.00995	-0.01918	-0.02005	-0.00009	-0.00031	-0.00998
	(0.00149)	(0.00212)	(0.00434)	(0.00383)	(0.00410)	(0.00442)	(0.00423)	(0.00963)
Black	-0.01345	-0.00226	-0.01383	-0.01532	-0.01908	-0.01676	-0.02105	-0.01288
	(0.00136)	(0.00225)	(0.00410)	(0.00332)	(0.00350)	(0.00371)	(0.00343)	(0.00875)
Hispanic	-0.01814	-0.00548	-0.01519	-0.01373	-0.00565	-0.00964	-0.01516	-0.02319
	(0.00150)	(0.00337)	(0.00046)	(0.00375)	(0.00424)	(0.00421)	(0.00399)	(0.00901)
Other race	-0.01022	0.00820	-0.00333	-0.01603	0.00650	-0.00691	-0.00723	-0.01418
	(0.00217)	(0.00600)	(0.00748)	(0.00577)	(0.00583)	(0.00589)	(0.00516)	(0.01206)
Married	0.00314	0.00147	-0.00102	0.00746	0.00161	-0.00140	0.00496	0.01549
	(0.00092)	(0.00160)	(0.02850)	(0.00231)	(0.00236)	(0.00258)	(0.00240)	(0.00607)
Female	-0.00259	-0.00179	-0.00865	-0.00288	-0.00835	-0.00209	-0.00532	0.00318
	(0.00088)	(0.00148)	(0.00275)	(0.00225)	(0.00236)	(0.00252)	(0.00236)	(0.00598)
N Children<5	-------	-------	0.00484	0.00105	0.00416	0.00382	0.00805	-0.00861
			(0.00272)	(0.00219)	(0.00231)	(0.00258)	(0.00242)	(0.00609)
Immigrant	-------	-------	------	-------	-0.02391	-0.01644	-0.01870	-0.01342
					(0.00396)	(0.00396)	(0.00360)	(0.00866)

Adj. R^2	0.034	0.036	0.037	0.039	0.039	0.041	0.052	0.061
Mean of Dep. Var.	0.0423	0.0191	0.0349	0.0462	0.0480	0.0478	0.0507	0.0655
N	227,629	40,482	22,188	42,162	39,862	34,485	40,682	7,768

[a]All equations also include a quadratic in usual weekly hours**.**
[b]Adds a vector of year indicators.
[c]Adds a vector of industry indicators as do the equations for subsequent years.

Table 2. Decompositions of Changes in the Incidence of Four-day Full-time Workweeks, U.S., 1973-2018

Base, end year	Actual in Start Year	$\beta^{*}_{e} \cdot X_b$	Actual in End Year	$\beta^{*}_{b} \cdot X_e$
1973, 2018	0.01907	0.08884	0.06553	0.01210
1985, 2018	0.03491	0.08650	0.06553	0.02726
1997, 2018	0.04799	0.07942	0.06553	0.04229
1973, 2004	0.01907	0.05403	0.05073	0.01612
1985, 2004	0.03491	0.05503	0.05073	0.03215

Table 3. The Incidence of Four-day Workweeks, Immigrants v. Natives, U.S., 1997-2018

	Mean	Regression Estimates and Standard Errors[a]	
Immigrant	0.138	-0.02372	-0.02633
		(0.00186)	(0.00224)
If Immigrant:			
Before age 15	0.216	------	0.00620
			(0.00414)
From English-speaking Country	0.180	------	0.00635
			(0.00442)

[a]Equations include all the control variables listed in Table 2 plus year indicators.

Table 4. Days of Work of Full-time Workers (32+ Hours/week), Netherlands 1975-2005[a]

Year	1975	1980	1985	1990	1995	2000	2005
Days/week							
3	0.0	0.2	0.0	0.0	0.3	0.4	0.2
4	**2.6**	**4.5[b]**	**7.9[b]**	**10.4[b]**	**12.1[b]**	**12.8**	**13.5**
5	66.6	69.5	64.2	63.8	58.7	61.4	60.0
6	25.3	20.4	20.2	20.1	22.0	18.6	20.4
7	5.5	5.4	7.7	5.7	6.9	6.8	5.9
Hours/week:							
Mean	42.09	42.15	42.07	42.07	42.98	42.21	43.20
S.D.	(7.21)	(6.85)	(8.08)	(7.63)	(7.83)	(8.03)	(8.33)
N =	308	602	778	830	998	458	675

[a]Based on authors' calculations from the *Tijdbestedingsonderzoek*.
[b]Significantly different from the previous entry at least at the 10-percent level.

Table 5. Earnings by Continuity of Four-Day Workweek, Full-time Workers, ATUS 2017-18, Dutch Time-Use Data, 1975-2005[a]

Workdays:	Leisure: Consecutive	Leisure: Non-consecutive	Effect of ln(Earnings) on the Probability of Consecutive Leisure	
	Ln(Earnings)[b]			
U.S.				
Mean	6.423	6.288		0.157
S.E.	(0.015)	(0.041)		(0.048)
N	432	59	Adj. R^2	0.015
Netherlands[c]				
Mean	3.128	3.093		0.257
S.E.	(0.013)	(0.014)		(0.147)
N	211	140	Adj. R^2	0.038

[a]Standard errors in parentheses.
[b]Imputed weekly earnings is the regressor, calculated at 40 hours per week.
[c]Hourly earnings imputed from the OSA Labor Market Survey. The equation also includes a quadratic in weekly hours and a vector of year indicators.

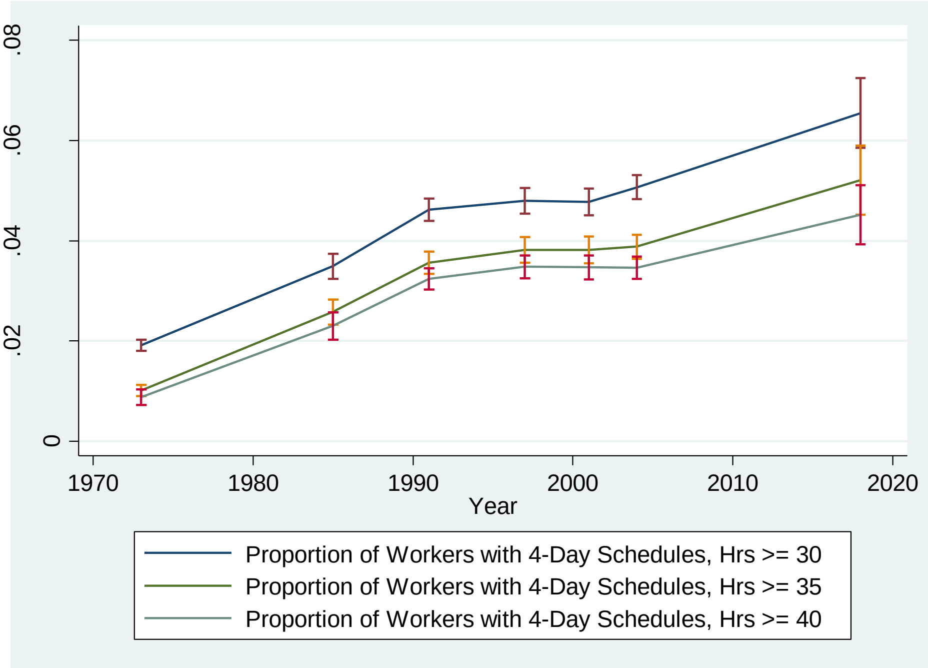

Figure 1a. Trends in Incidence of Four-day Workweeks among Full-time workers, by Weekly Hours, 1973-2018 (95-percent confidence Intervals included)

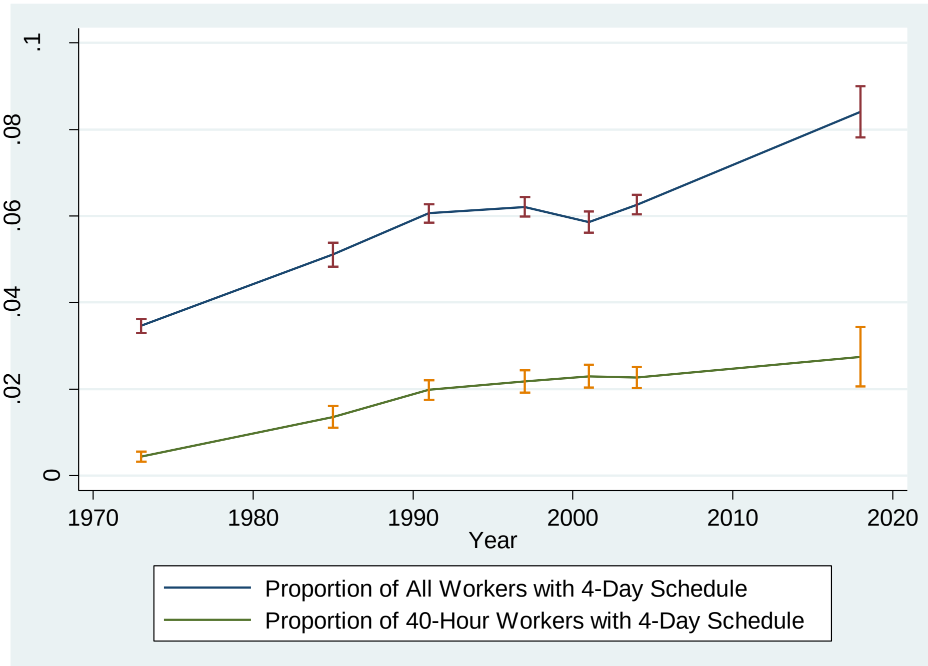

Figure 1b. Trends in Incidence of Four-day Workweeks among All and Forty-Hour Workers, 1973-2018

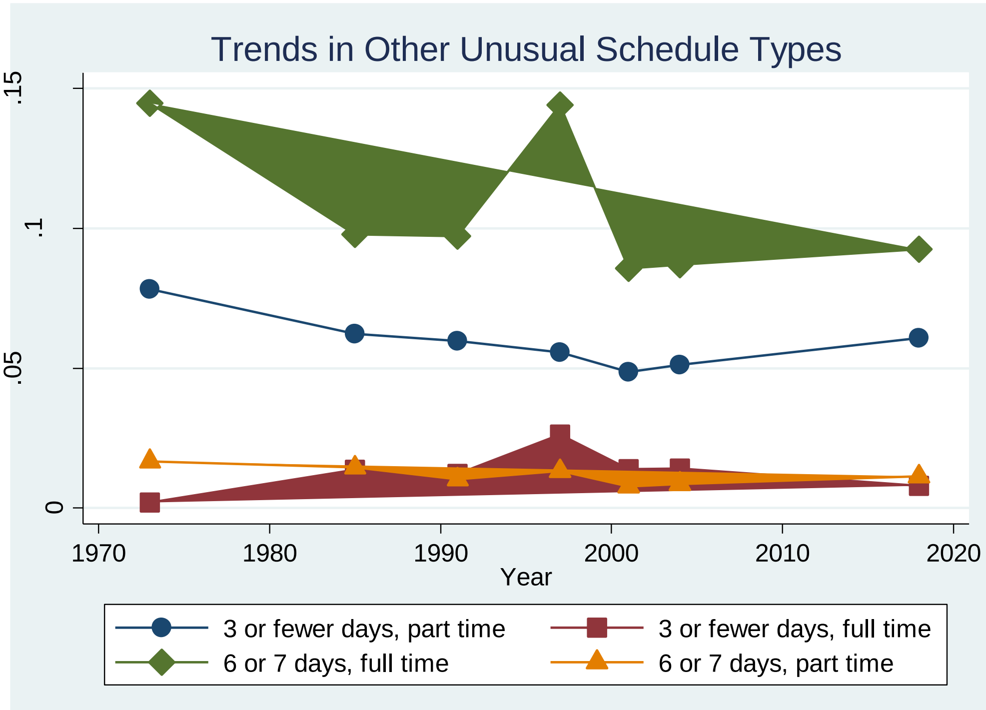

Figure 2. Trends in Various Unusual Work Schedules, 1973-2018

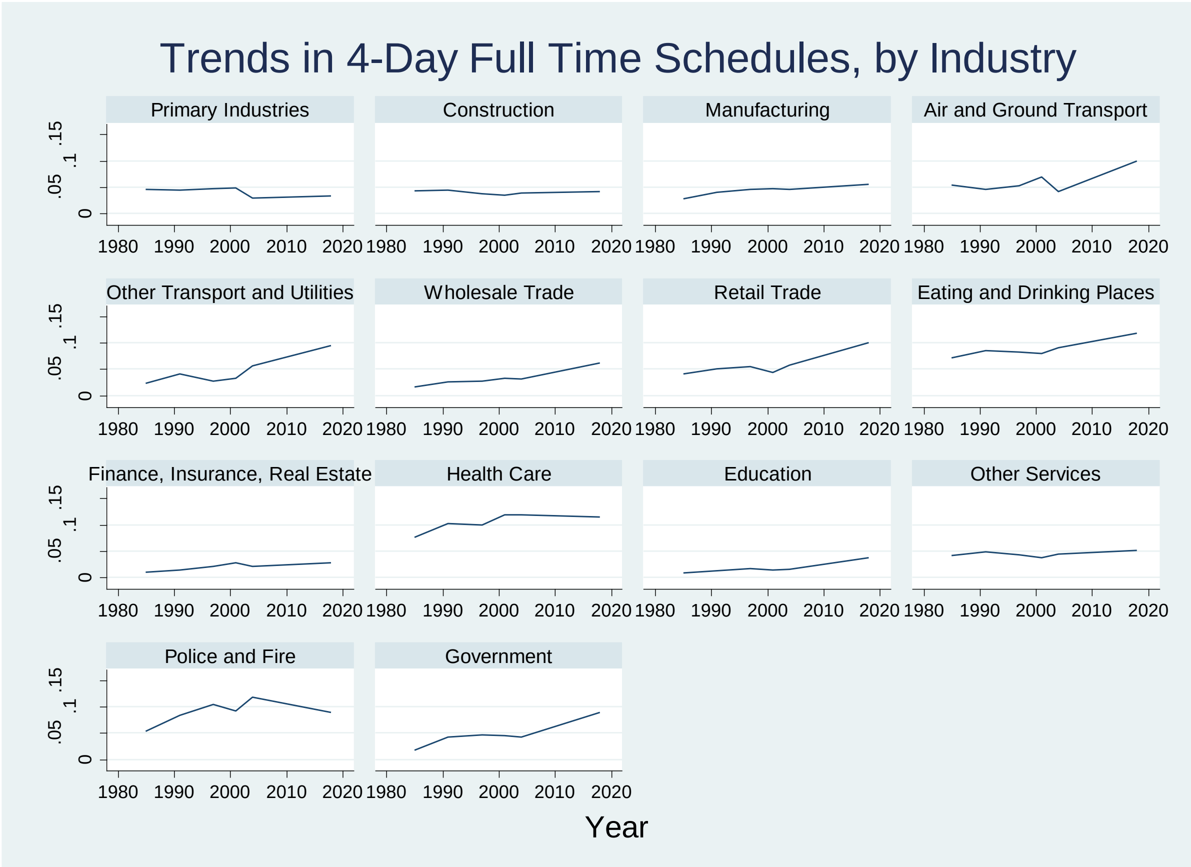

Figure 3. Trends in Four-day Schedules by Major Industry

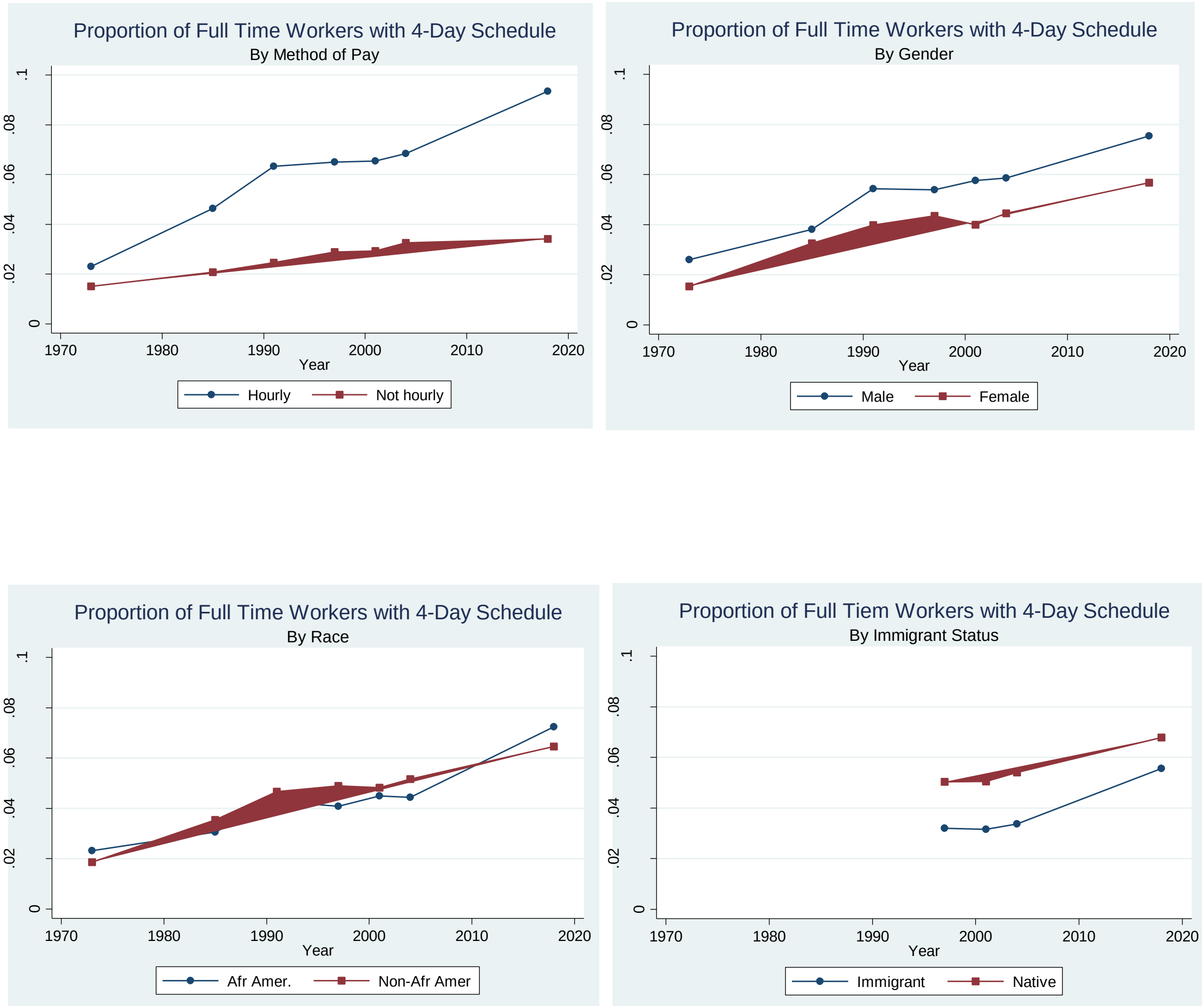

Figure 4. Trends in Four-day Schedules by Payment Method, Gender, Race, and Nativity.

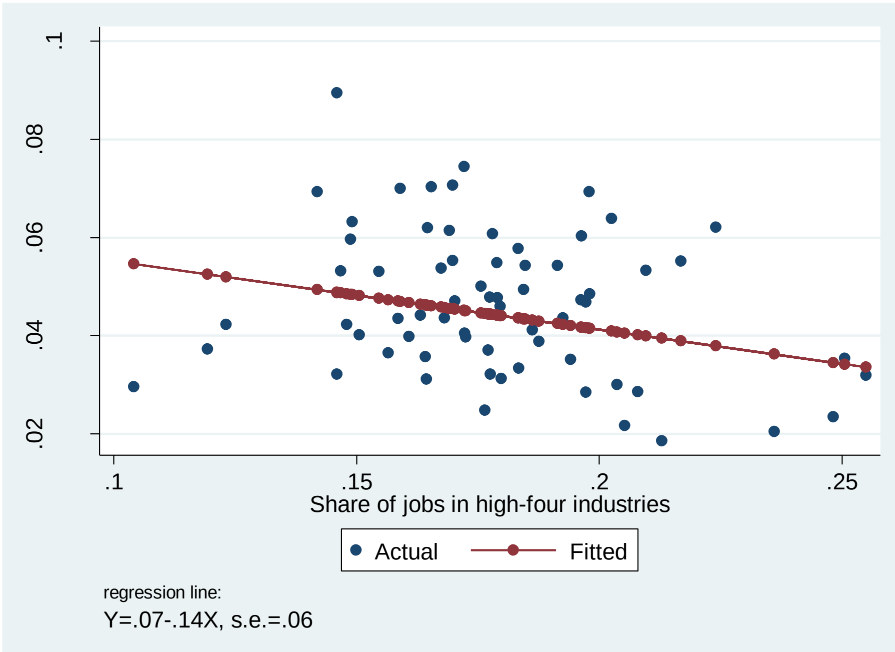

Figure 5: Proportions of Four-day Schedules and Employment in High Four-day Industries, 1997-2004 (N = 67 MSAs)

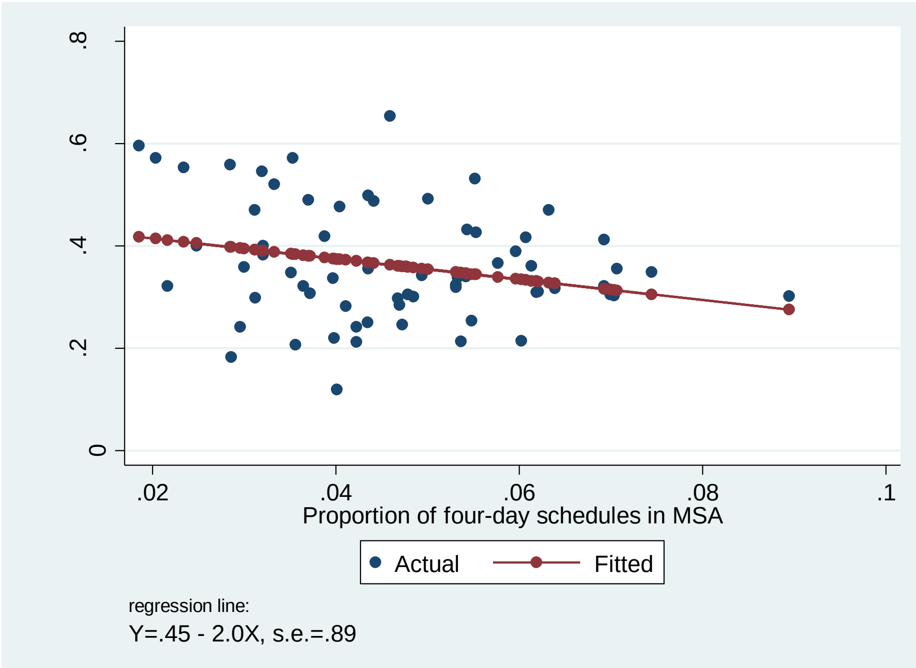

Figure 6a: Overall Proportion of Four-day Schedules and Proportion of Four-day Schedules in High-four Industries, 1997-2004 (N = 67 MSAs)

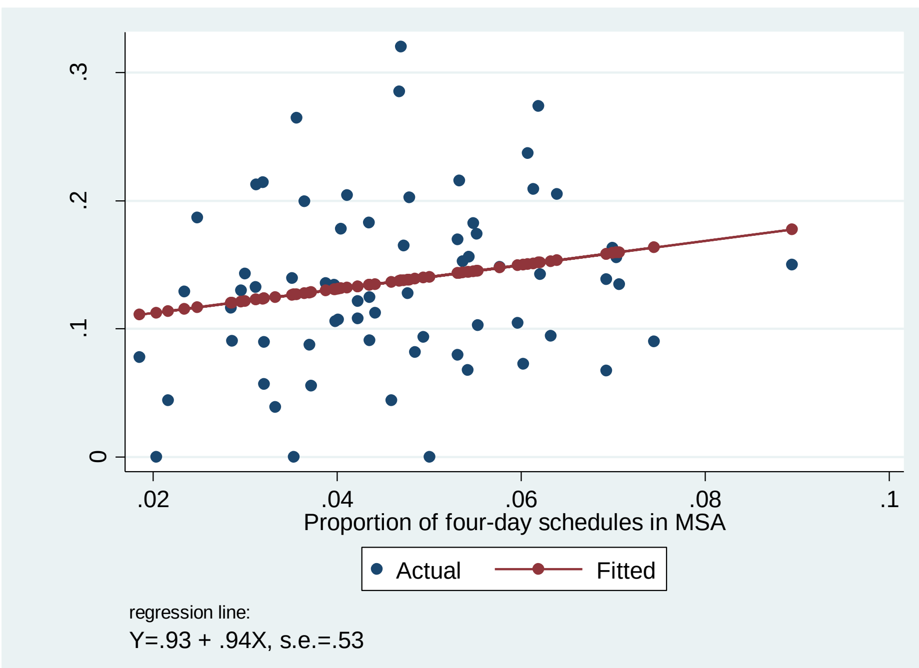

Figure 6b: **Overall Proportion of Four-day Schedules and Proportion of Four-day Schedules in Low-four industries, 1997-2004 (N = 67 MSAs)**